EC7-1813CLD2NA SERIES

基于 Intel® Luna Pier 平台 Mini-ITX 主板

Mini-ITX Motherboard Based on Intel® Luna Pier Platform

Version: C02

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安全使用小常识

1. 产品使用前，务必仔细阅读产品说明书；
2. 对未准备安装的板卡，应将其保存在防静电保护袋中；
3. 在从防静电保护袋中拿出板卡前，应将手先置于接地金属物体上一会儿（比如 10 秒钟），以释放身体及手中的静电；
4. 在拿板卡时，需佩戴静电保护手套，并且应该养成只触及其边缘部分的习惯；
5. 为避免人体被电击或产品被损坏，在每次对主板、板卡进行拔插或重新配置时，须先关闭交流电源或将交流电源线从电源插座中拔掉；
6. 在需对板卡或整机进行搬动前，务必先将交流电源线从电源插座中拔掉；
7. 对整机产品，需增加 / 减少板卡时，务必先拔掉交流电源；
8. 当您需连接或拔除任何设备前，须确定所有的电源线事先已被拔掉；
9. 为避免频繁开关机对产品造成不必要的损伤，关机后，应至少等待 30 秒后再开机。

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第一章　产品介绍

简介

该产品是基于 Intel® Luna Pier Refresh 平台开发的符合 Mini-ITX 单板规范的嵌入式主板。

主板采用板载 Intel® Atom™ D510/D410 处理器 + Intel® ICH8M 的技术方案实现。板上提供 1 个 SO-DIMM DDR2 插槽，最大内存容量可达 2GB。支持 VGA、24 位 LVDS、DVI 三种显示；2 个 10/100/1000M 以太网控制器；8 个 USB2.0 接口；2 个 SATA 硬盘接口；1 个 IDE 接口，1 个 Type I/II CF 接口；1 个 HD Audio 接口；6 或 10 个 COM 口（其中 1 个支持 RS-232/ RS-485，2 个支持串口供电功能）；1 个 PS/2 键盘鼠标接口；1 个 PCI 插槽；主板采用标准 ATX 电源供电或 12V 单电源供电。

本产品采用Intel®的低功耗解决方案，具有多串口，串口供电，支持VGA和LVDS双显示，支持PCI扩展等特点，满足POS和彩票行业的行业需求。同时也适用于对主板性能要求不高的广告机，查询机，自助终端等需求。

机械尺寸、重量与环境

- 外形尺寸：170mm（长）×177.9mm（宽）×41.5mm（高）
- 净重：0.436Kg；
- 工作环境：

  温度：-10℃～60℃；

  湿度：5%～95%（非凝结状态）；
- 贮存环境：

  温度：-40℃～75℃；

  湿度：5%～95%（非凝结状态）；

典型功耗

典型功耗是基于以下配置闲置状态的数值。

1、EC7-1813CLD2NA-D4V10COM 的典型功耗如下：

CPU：OnBoard Intel® Atom™ D410 1.66GHz (166*10/L2=512K)

内存：Transcend DDRII 800 2GB

硬盘：HITIACH 2TB SATA HDD

- +12V@1.55A；+5%/-3%；

2、EC7-1813CLD2NA-D5 的典型功耗如下：

CPU：Intel® Atom™ D510

内存：DDRII800 2GB Kingston

硬盘：Seagate 500GB SATA

- +3.3V@0.62A；+5%/-3%；
- +5V@1.15A；+5%/-3%；
- +12V@0.52A；+5%/-3%。

微处理器

板载Intel® Atom™ D510（双核）/D410（单核）处理器，内部集成了内存控制器和图形控制器。

芯片组

Intel® Atom™D510/D410处理器 + Intel® ICH8M

系统内存

提供1条200 Pin SO-DIMM DDR2内存插槽，支持Un-buffered Non-ECC内存，支持最大内存容量2GB，支持的内存频率为667MHz。

显示功能

- 采用CPU内置集成图形控制器；

- 支持VGA、单通道24位LVDS、DVI三种显示，其中24位LVDS和DVI为同源输入，LVDS和DVI输出为Clone模式；可支持VGA+LVDS（或DVI）输出，Clone或扩展模式；可支持三显；支持热插拔功能。
- VGA支持最大分辨率及刷新率为2048×1536@60Hz；LVDS支持的最大分辨率为1366×768；DVI支持的最大分辨率为1600X1200。

网络功能

提供2个10/100/1000Mbps网络接口，LAN1可支持网络唤醒功能；LAN1可支持网络PXE启动。

音频功能

采用HD标准，支持 MIC-IN/LINE-IN/LINE-OUT。

电源特性

采用ATX/AT电源，ATX电源支持 ACPI1.0b 规范，支持S0、S1、S4、S5状态，AT电源支持单12V电源供电。

扩展总线

提供1个PCI插槽，兼容PCI 2.3标准。

Watchdog功能

- 支持 255 级，可编程按分或秒；
- 支持看门狗超时中断或复位系统。

操作系统

支持操作系统：Windows XP、Windows 2000、Linux。

I/O接口

- 提供 1 个并口，支持 SSP/EEP/ECP 工作模式；支持 BIOS 修改工作模式；
- 提供 10 个串口，其中 COM2 支持 RS-232/RS-485 模式选择；COM1 支持 Modem 唤醒功能；COM3，COM4 支持 5V/12V 电源输出；
- 提供 1 个 IDE 接口；
- 提供 1 个 CF 卡接口；
- 提供 2 个 SATA 接口，支持热插拔功能；
- 提供 8 个 USB2.0 接口；USB1～USB4 直接由连接器形式接出，USB5～USB8 采用 2×5Pin 插针引出；
- 提供 2 个 PS/2 键盘/鼠标接口，其中 1 个为标准接口，1 个为插针接口；
- 提供 1 个 8 路数字 I/O 接口。

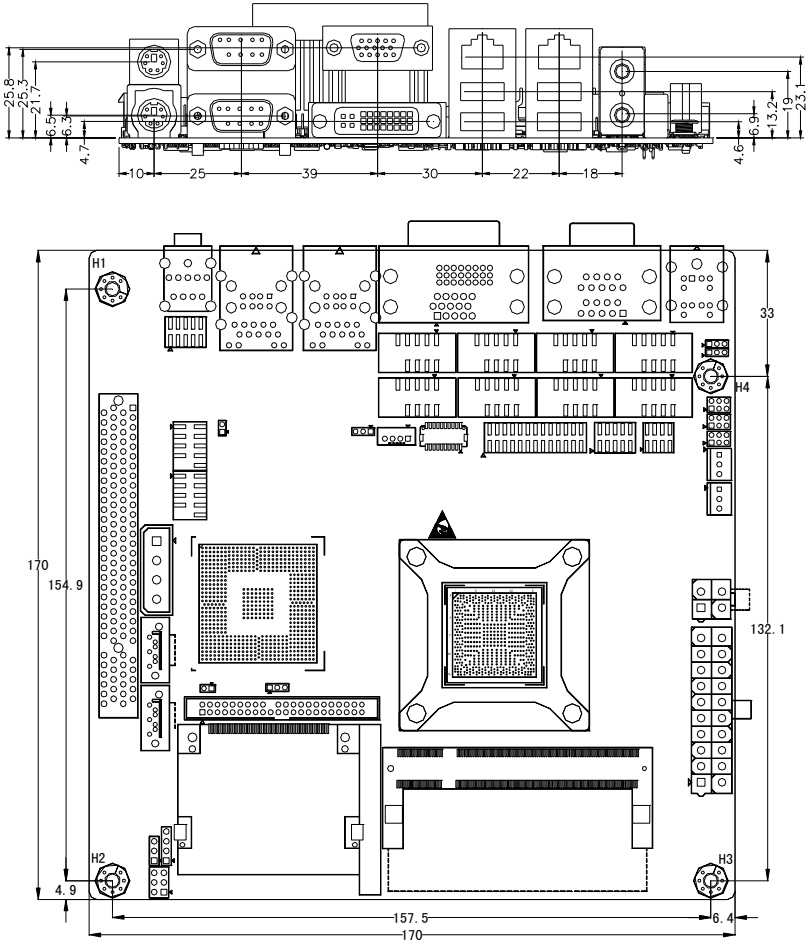
提示：如何识别报警声

1、长鸣声为系统内存出错。

2、短“嘀”一声为开机声。

第二章　安装说明

产品外形尺寸图

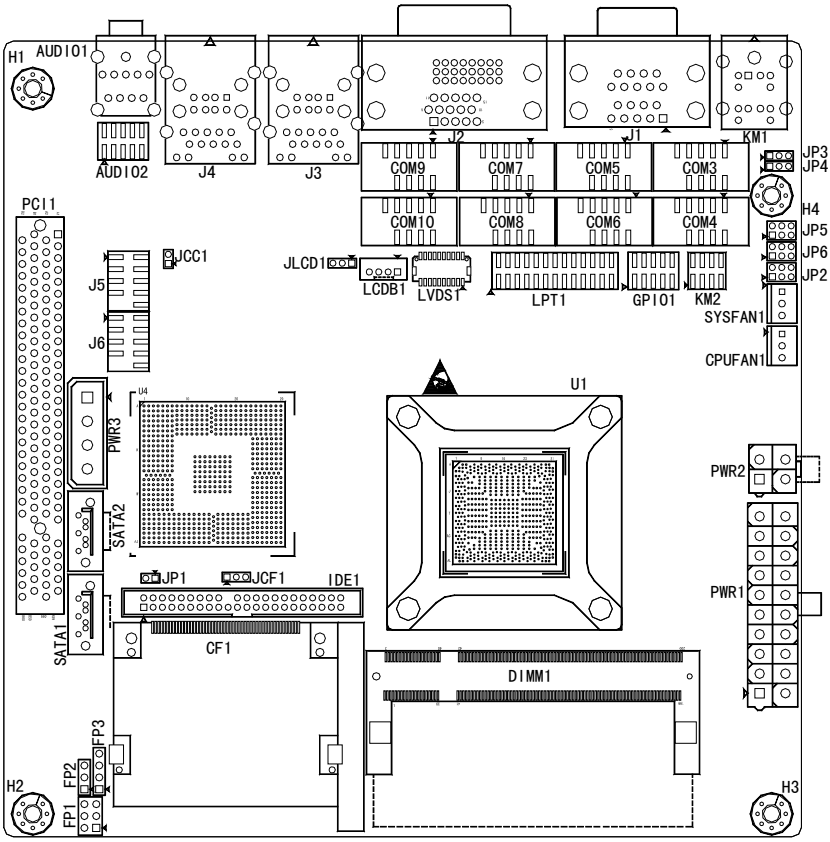


单位：mm

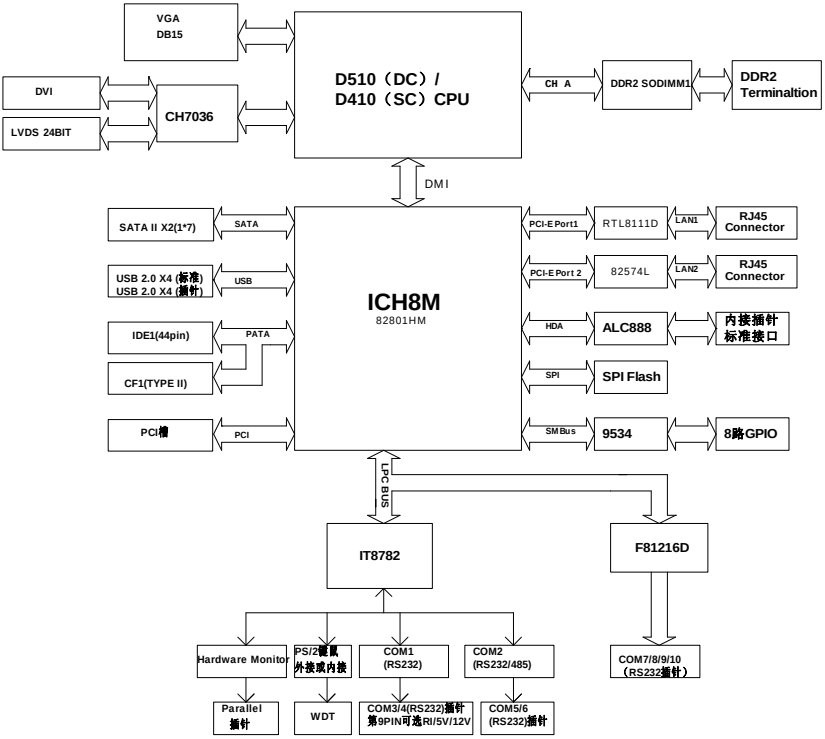
警告！

请务必选择合适的螺钉和使用正确的安装方法（包括板卡定位、CPU、散热器等安装），否则可能损坏板。此板推荐 H1～H4 使用 M3×6 GB9074.4-88 螺钉。

接口位置示意图


H1
AUDIO1
AUDIO2
J4
J3
J2
J1
KM1
JP3
JP4
COM9
COM7
COM5
COM3
COM10
COM8
COM6
COM4
H4
JP5
JP6
JP2
PCI1
JCC1
JLCD1
LCDB1
LVDS1
LPT1
GPIO1
KM2
SYSFAN1
CPUFAN1
J5
J6
U4
U1
PWR3
PWR2
SATA2
JP1
JCF1
IDE1
PWR1
SATA1
CF1
DIMM1
FP3
FP2
FP1
H2
H3

架构图



提示：如何识别跳线、接口第一脚

1、观察插头、插座旁边的文字标记，通常用“1”或加粗的线条或三角符号表示。

2、看看背面的焊盘，通常方型焊盘为第一脚。

跳线设置

1.　JCC1：CMOS内容清除/保持设置（脚距：2.0mm）

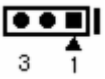
CMOS由板上钮扣电池供电。清CMOS会导致永久性消除以前系统配置并将其设为原始（工厂设置）系统设置。其步骤：(1)关闭计算机，断开电源；(2)瞬间短接JCC1插针；(3)开计算机；(4)启动时按屏幕提示按键进入BIOS设置，重新加载最优缺省值；(5)保存并退出设置。设置方式如下：

JCC1

设置	功能
1-2 开路	正常工作状态（Default）
1-2 短路	清除 CMOS 内容，所有 BIOS 设置恢复成出厂值。

2.　JLCD1：LCD工作电压选择（脚距：2.0mm）

不同的LCD屏电压可能不同，本板提供了3.3V和5V两种电压选择，当所选择的LCD电压与所使用的LCD屏的工作电压一致时，LCD屏才能正常显示。设置方式如下：

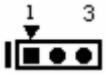


JLCD1

设置	功能
1-2 短路	+3.3V（Default）
2-3 短路	+5V

3.　JCF1：CF卡工作电压选择（脚距：2.0mm）

不同的CF卡的工作电压可能不同，本板提供了3.3V和5V两种电压选择，当所选择的CF卡工作电压与所使用的CF卡工作电压一致时，才能保证系统的稳定性。设置方式如下：



JCF1

设置	功能
1-2 短路	+3.3V
2-3 短路	+5V（Default）

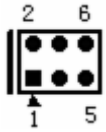
注：CF卡电压选择是为兼容不同的CF卡而设置，对未明确标示工作电压的CF卡需根据实际使用情况选择CF卡电压。

4. JP1：CF卡主从模式选择 （脚距：2.0mm）

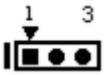
JP1

设置	功能
1-2 短路	Master
1-2 开路	Slave（Default）

5. JP2～JP4：COM2串口模式选择（脚距：2.0mm）



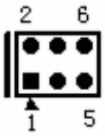
JP2



JP3～JP4

管脚设置	模式选择	
	RS-232 (Default)	RS-485
JP2	1-2	3-4
JP3	1-2	2-3
JP4	1-2	2-3

6. JP5～JP6：COM3/COM4串口 Pin 9功能选择（脚距：2.0mm）



JP5/JP6

管脚设置	COM3/COM4 Pin9 功能选择		
	RI#(Default)	VCC5V	VCC12V
JP5	1-2	3-4	5-6
JP6	1-2	3-4	5-6

系统内存的安装

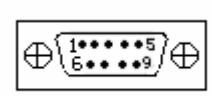
本板提供 1 条 200Pin DDRⅡ SO-DIMM 插槽（DIMM1）。安装内存条时，要注意以下几点：

- 拨开内存槽两边的耳扣，安装时先将内存条的缺口和内存槽的缺口对准后再向下用力压到位。
- 使用符合该主板 Intel® Chipset 所支持的 1.8V DDRⅡ 667MHz 规格的内存，主板支持最大内存容量达 2GB。

- 最好选择带 SPD（内存自动识别功能）的内存条，以保证内存条工作稳定。

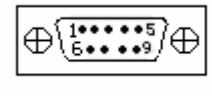
串口

本板提供2个标准DB9串口，其中COM1支持Modem唤醒功能和RS-232模式，COM2支持RS-232/RS-485模式选择；另外提供8个2×5Pin插针串口（脚距：2.54mm），支持RS-232模式，管脚定义如下：



J1（COM1）

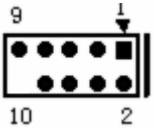
管脚	信号名称
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#



J1（COM2）

管脚	信号名称	
	RS-232	RS-485
1	DCD#	Data-
2	RXD	Data+
3	TXD	NC
4	DTR#	NC
5	GND	GND
6	DSR#	NC
7	RTS#	NC
8	CTS#	NC
9	RI#	NC

注：COM2 在 RS-485 模式下，数据收发方向为自动控制。



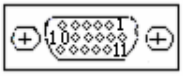
COM3～COM10

管脚	信号名称
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#
10	NA

显示接口

本板提供一组24位单通道LVDS接口和1个VGA+DVI-D的双层接口（板上标识为J2：下层为DVI接口，上层为VGA接口）。管脚定义如下：

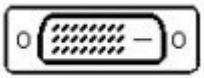
1. VGA接口



J2（VGA）

管脚	信号名称	管脚	信号名称
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

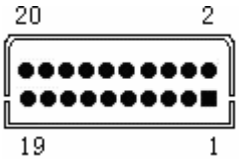
2. DVI-D 接口



J2（DVI）

管脚	信号名称	管脚	信号名称
1	DATA2-	13	NC
2	DATA2+	14	+5V
3	GND_DVI	15	GND
4	NC	16	HOTPLUG
5	NC	17	DATA0-
6	DDCCLK	18	DATA0+
7	DDCDATA	19	GND_DVI
8	NC	20	NC
9	DATA1-	21	NC
10	DATA1+	22	GND_DVI
11	GND_DVI	23	CLK+
12	NC	24	CLK-

3. 单通道24位LVDS接口



LVDS1

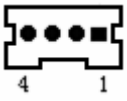
（脚距：1.0mm）

管脚	信号名称	管脚	信号名称
1	LVDS_D0+	2	LVDS_D0-
3	GND	4	GND
5	LVDS_D1+	6	LVDS_D1-
7	GND	8	GND
9	LVDS_D2+	10	LVDS_D2-
11	GND	12	GND
13	CLK+	14	CLK-
15	GND	16	GND
17	LVDS_D3+	18	LVDS_D3-
19	VDD	20	VDD

注：本主板用到LVDS插座型号为DF20G-20DP-1V；对应端子的型号为DF20A-20DF-1C。

LCD背光控制接口

本板提供1个1×4Pin LCD背光控制接口（脚距：2.0mm），管脚定义如下：



LCDB1

管脚	信号名称
1	VCC_LCDBKLT
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

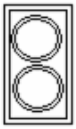
注：VCC_LCDBKLT----+12V背光电源（此脚电流限制在1A以下）；

LCD_BKLTCTL---背光控制（该信号由Pineview D输出，为PWM信号，电压幅值0V～3.3V，占空比在0～100%之间）；

LCD_BKLTEN ----背光使能，高有效。

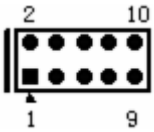
音频接口

本板提供1个双层Audio接口和1个2×5Pin AUDIO插针接口。



AUDIO1

管脚	信号名称
1	LINE_OUT
2	MIC_IN



AUDIO2

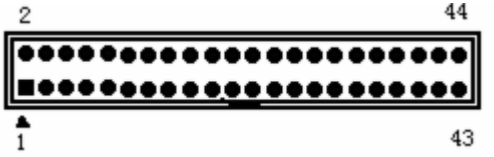
（脚距：2.0mm）

管脚	信号名称	管脚	信号名称
1	LOUT_R	2	LOUT_L
3	GND_AUDIO	4	GND_AUDIO
5	LIN_R	6	LIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MIC_L	10	MIC_R

IDE接口

本板提供一组并行IDE接口（脚距：2.0mm），并与CF卡接口共用IDE总线，故安装IDE设备时，需注意以下：

- 如果 CF 卡接口插有 CF 存储卡，IDE 接口只可以连接一台 IDE 设备，并且 CF 存储卡与 IDE 设备，一个为主设备（Master），一个为从设备（Slave），CF 存储卡主从可通过 JP1 来设备，硬盘上提供相应的跳线来将其配置成主设备还是从设备使用；
- 如果 CF 卡接口没有使用 CF 存储卡，IDE 接口可以连接两台 IDE 设备，设备的连接方法是：主设备接在电缆的末端，从设备接在电缆的中间；连接使用 Ultra 66/100 的硬盘时，必须使用 80 线的专用扁平电缆。



IDE1

管脚	信号名称	管脚	信号名称
1	RESET#	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	Key
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IORDY	28	GND

29	DACK#	30	GND
31	IRQ	32	NC
33	DA1	34	ATA66_DET
35	DA0	36	DA2
37	CS1#	38	CS3#
39	LED#	40	GND
41	+5V	42	+5V
43	GND	44	GND

SATA接口

提供2个SATA插座，管脚定义如下：

SATA1/SATA2

管脚	信号名称
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA硬盘热插拔

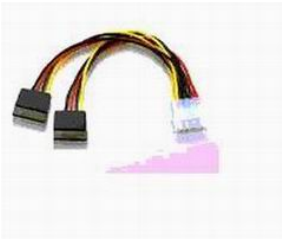
SATA 硬盘热插拔需注意：

（1）　硬盘必须支持：SATA 2.0 接口，并且采用 15 芯 SATA 硬盘电源接口。

（2）　芯片组驱动程序支持 SATA 硬盘的热插拔。

（3）　不能对操作系统所在的 SATA 硬盘进行带电热插拔。

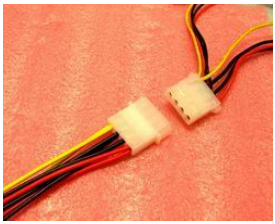
SATA 硬盘数据线

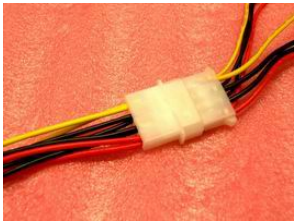


SATA 硬盘电源线

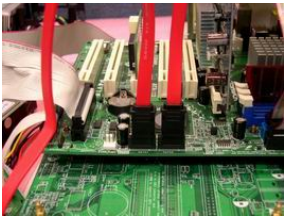
请按照如下步骤进行 SATA 硬盘热插拔，否则，操作不当会导致硬盘损坏和数据丢失。

热插入SATA硬盘步骤：





步骤1：请将SATA电源线1x4-针脚(白色)一端接到电源适配器的1x4-针脚电源线一端。



步骤2：将SATA 数据线接到主板上的SATA接口。

步骤3：将SATA电源线15-针脚接口(黑色)一端接到SATA硬盘。

步骤4：将SATA数据线接到SATA硬盘。

热拔出SATA硬盘步骤：

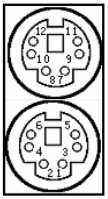
步骤 1：从设备管理器中卸载该硬盘。

步骤 2：从 SATA 硬盘一侧拔去 SATA 数据线。

步骤 3：从 SATA 硬盘一侧拔去 SATA 15-针脚电源线接口(黑色)。

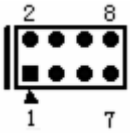
键盘鼠标接口

此板提供1个标准的PS/2键盘/鼠标组合接口和1个插针键盘鼠标接口(脚距：2.0mm）。



KM1

管脚	信号名称	管脚	信号名称
1	KB_DATA	7	MS_DATA
2	NC	8	NC
3	GND	9	GND
4	+5V	10	+5V
5	KB_CLK	11	MS_CLK
6	NC	12	NC



KM2

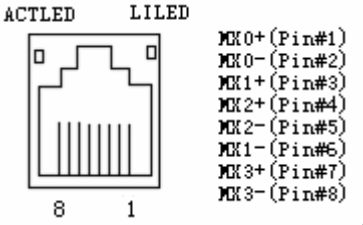
管脚	信号名称	管脚	信号名称
1	KB_DATA	2	MS_DATA
3	KB_CLK	4	MS_CLK
5	GND	6	GND
7	+5V	8	+5V

网络接口与USB接口

主板上共提供2个网络接口与及8个USB接口，其中每个网络接口与2个USB共用一组模（即J3、J4分别包括1个网口和2个USB接口）。此外主板还提供2个2X5 Pin插针形式的USB接口（J5，J6），可以连接4个USB。

网络接口

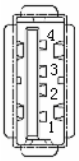
主板上有2个10/100/1000Mbps以太网接口，LILED和ACTLED是以太网接口两边的LED指示灯，它们显示着LAN的活动和传输状态。请参考以下每一个LED的状态描述：



J3（LAN1），J4（LAN2）

ACTLED （单色：绿色灯）	网络活动 指示状态		LILED （双色：橙绿双色）	网络速度 指示状态
			绿色	1000Mbps
闪烁	有数据传输		橙色	100Mbps
灭	无数据传输		灭	10Mbps

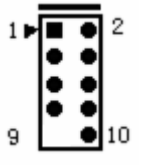
USB接口



J3（USB1/USB2）

J4（USB3/USB4）

管脚	信号名称
1	+5V
2	USB_Data-
3	USB_Data+
4	GND

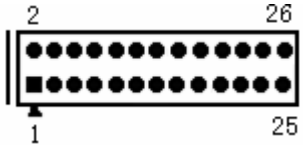


J5（USB5/USB6）
J6（USB7/USB8）
脚距：2.54mm

管脚	信号名称	管脚	信号名称
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

并口

本板提供1个2×13Pin插针并口（脚距：2.0mm）。

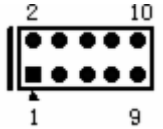


LPT1

管脚	信号名称	管脚	信号名称
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

GPIO接口

本板提供1个2×5Pin GPIO插针接口（脚距：2.0mm）。



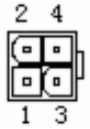
GPIO1

管脚	信号名称	管脚	信号名称
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

说明：GPIO各引脚是双向信号，为方便测试与应用，出厂默认值为连接器的第1，3，5，7脚为输入，第2，4，6，8脚为输出。

电源接口

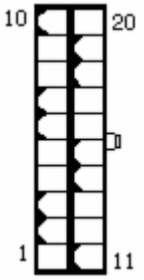
1)　**AT电源接口：单12V 电源接口(脚距：4.2mm)**



PWR2

管脚	信号名称
1	GND
2	GND
3	+12V
4	+12V

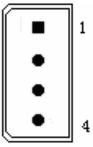
2)　**ATX电源接口（脚距：4.2mm）**



PWR1

管脚	信号名称	管脚	信号名称
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	-5V
9	+5VSB	19	+5V
10	+12V	20	+5V

3） SATA电源转接接口（脚距：5.08mm）

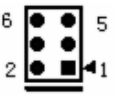


PWR3

管脚	信号名称
1	+12V
2	GND
3	GND
4	+5V

状态指示控制接口

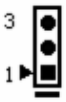
1） ATX电源开关及硬盘指示灯接口（脚距：2.54mm）



FP1

管脚	信号名称	管脚	信号名称
1	PWRBTN#	2	GND
3	GND	4	RESET#
5	HDD_LED-	6	HDD_LED+

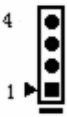
2） 电源指示灯接口（脚距：2.54mm）



FP2

管脚	信号名称
1	PWR_LED+
2	NC
3	GND

3） 扬声器输出接口（脚距：2.54mm）

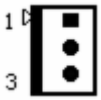


FP3

管脚	信号名称
1	SPEAKER
2	NC
3	GND
4	+5V

风扇接口

本板提供2个1×3Pin风扇接口（脚距：2.54mm）。



CPUFAN1，SYSFAN1

管脚	信号名称
1	GND
2	+12V
3	FAN_IO

FAN_IO ：风扇转速脉冲输出。

CF卡

板上标识为CF1。

管脚	信号名称	管脚	信号名称
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

扩展插槽

PCI插槽作为标准PCI（version 2.3）接口（PCI1），管脚定义如下：

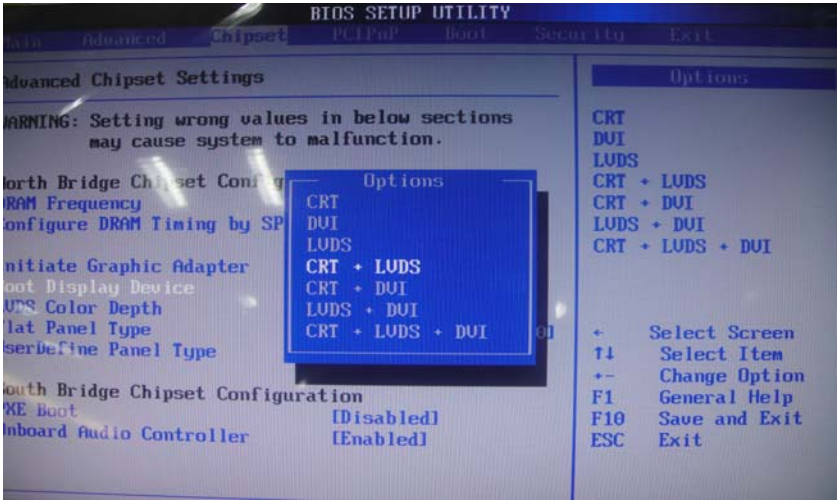
管脚	信号名称	管脚	信号名称	管脚	信号名称	管脚	信号名称
A1	TRST#	A31	PCI_AD18	B1	-12V	B31	+3.3V
A2	+12V	A32	PCI_AD16	B2	TCK	B32	PCI_AD17
A3	TMS	A33	+3.3V	B3	GND	B33	PCI_C/BE#2
A4	TDI	A34	PCI_FRAME#	B4	TDO	B34	GND
A5	+5V	A35	GND	B5	+5V	B35	PCI_IRDY#
A6	INTA#	A36	PCI_TRDY#	B6	+5V	B36	+3.3V
A7	INTC#	A37	GND	B7	INTB#	B37	PCI_DEVSEL#
A8	+5V	A38	PCI_STOP#	B8	INTD#	B38	GND
A9	Null	A39	+3.3V	B9	PRSNT1#	B39	PCI_PLOCK#
A10	+5V	A40	SMCLK	B10	Null	B40	PCI_PERR#
A11	Null	A41	SMDATA	B11	PRSNT2#	B41	+3.3V
A12	GND	A42	GND	B12	GND	B42	PCI_SERR#
A13	GND	A43	PCI_PAR	B13	GND	B43	+3.3V
A14	3.3Vaux	A44	PCI_AD15	B14	Null	B44	PCI_C/BE#1
A15	PCI_RST#	A45	+3.3V	B15	GND	B45	PCI_AD14
A16	+5V	A46	PCI_AD13	B16	PCI_CLK	B46	GND
A17	PCI_GNT#	A47	PCI_AD11	B17	GND	B47	PCI_AD12
A18	GND	A48	GND	B18	PCI_REQ#	B48	PCI_AD10
A19	PCI_PME#	A49	PCI_AD9	B19	+5V	B49	GND
A20	PCI_AD30	A50	PCI_C/BE#0	B20	PCI_AD31	B50	PCI_AD8
A21	+3.3V	A51	+3.3V	B21	PCI_AD29	B51	PCI_AD7
A22	PCI_AD28	A52	PCI_AD6	B22	GND	B52	+3.3V
A23	PCI_AD26	A53	PCI_AD4	B23	PCI_AD27	B53	PCI_AD5
A24	GND	A54	GND	B24	PCI_AD25	B54	PCI_AD3
A25	PCI_AD24	A55	PCI_AD2	B25	+3.3V	B55	GND
A26	PCI_IDSEL	A56	PCI_AD0	B26	PCI_C/BE#3	B56	PCI_AD1
A27	+3.3V	A57	+5V	B27	PCI_AD23	B57	+5V
A28	PCI_AD22	A58	PCI_REQ64#	B28	GND	B58	PCI_ACK64#
A29	PCI_AD20	A59	+5V	B29	PCI_AD21	B59	+5V
A30	GND	A60	+5V	B30	PCI_AD19	B60	+5V

注：若使用PWR2供电时，管脚B1为NC。

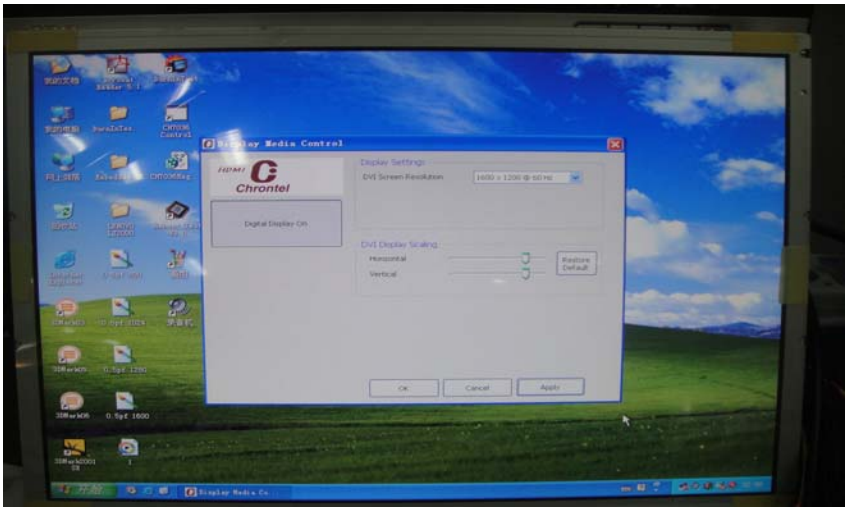
DVI显示输出设置说明

本产品支持VGA、LVDS、DVI三种显示；DVI显示和LVDS显示是Clone模式，设置如下：

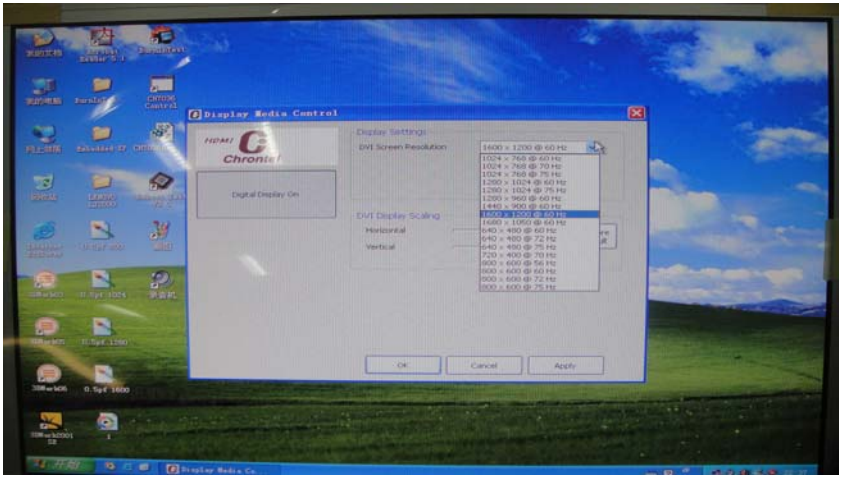
1. 进入 BIOS 菜单，设置带有 DVI 显示模式，如下图：



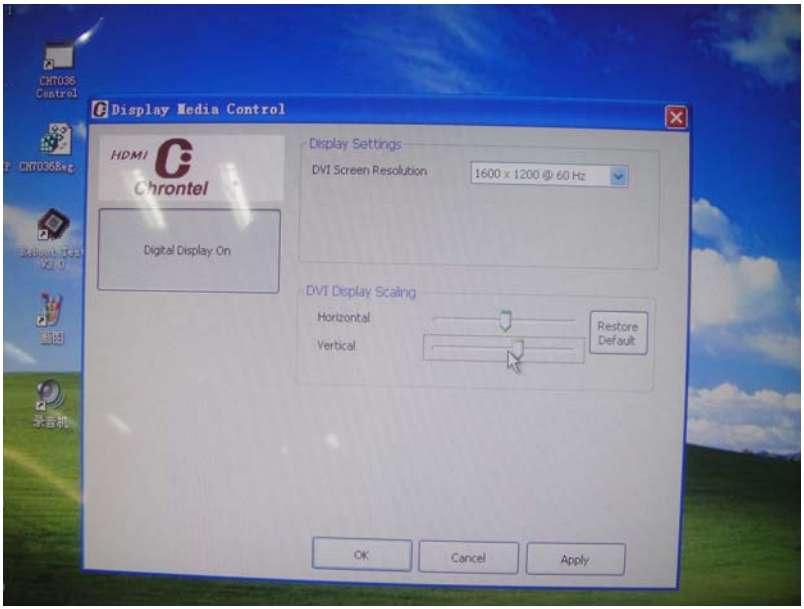
2. 第一次安装操作系统完成之后，需要安装 DVI 的驱动程式，按出货光盘配置安装，此驱动只设置 DVI 显示功能。客户根据自己所接 LVDS 屏选择 18 位/24 位 LVDS 输出，详细设置部分见驱动程序中的 Readme.txt 部分。安装完成驱动后图示如下：



3.　设置 DVI 分辨率，主板在读取显示器支持的分辨率之后，会显示出显示器本身可支持的分辨率，如下图：



4.　设置 DVI 显示尺寸，DVI 显示可以拉伸屏幕尺寸，如下图：



5.　驱动设置后，有记忆功能，下次开机显示后仍按此次参数配置。

6.　DVI 显示功能是由 CH7036A 方案实现，方案本身需遵循以下建议：建议一，DVI 选择输出的分辨率不小于 BIOS 菜单下选择的 LVDS 分辨率，若 DVI 输出的分辨率低于 LVDS 分辨率，可能会出现某些分辨率下字体模糊问题。建议二，若背景选为纯浅蓝色，在某些分辨率下会出现轻微的竖条纹，这是由于 CH7036A 方案的实现机制所形成的，属正常现象。

第三章 BIOS功能介绍

简介

BIOS（Basic Input and Output System：基本输入输出系统）固化在 CPU 板上的闪存存储器中，主要功能包括：初始化系统硬件，设置各系统部件的工作状态，调整各系统部件的工作参数，诊断系统各部件的功能并报告故障，给上层软件系统提供硬件操作控制接口，引导操作系统等。BIOS 提供用户一个菜单式的人机接口，方便用户配置各系统参数设置，控制电源管理模式，调整系统设备的资源分配等等。

正确设置 BIOS 各项参数，可使系统稳定可靠地工作，同时也能提升系统的整体性能。不适当的甚至错误的 BIOS 参数设置，则会使系统工作性能大为降低，使系统工作不稳定，甚至无法正常工作。

BIOS参数设置

每当系统接通电源，正常开机后，便可看见进入 BIOS 设置程序提示的信息。此时（其它时间无效），按下提示信息所指定的按键（通常为<Del>键）即可进入 BIOS 设置程序。

CMOS 中 BIOS 设置内容被破坏时，系统也会要求进入 BIOS 设置或选择某种默认设置值。

通过BIOS修改的所有设置值都保存在系统的CMOS存储器中，该CMOS存储器由电池供电，即使切断外部电源，其内容也不会丢失，除非执行清除CMOS内容的操作。

注意！BIOS的设置直接影响到电脑的性能，设置错误的参数将造成电脑的损坏，甚至不能开机，请清CMOS后再使用BIOS内置缺省值来恢复系统正常运行。

由于本公司不断研发更新BIOS，其设置界面也会略有不同，以下的画面供您参考，有可能跟您目前所使用的BIOS设置程序不完全相同。

BIOS基本功能设置

当SETUP程序启动之后，您可以看到CMOS Setup Utility主画面如下：

BIOS SETUP UTILITY	
System Overview	←→ Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Processor Type : Intel(R) Atom(TM) CPU K510 @ 1.66GHz Speed :1666MHz Cores :2 System Memory Size :1015MB System Time [00:47:55] System Date [Mon 01/11/2010]	
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◆ **Main**

➢ **System Time**

选择此选项，用< + > / < - >来设置目前的时间。以时/分/秒的格式来表示。各项目合理的范围是：Hour/时(00-23)， Minute/分(00-59)，Second/秒(00-59)。

➢ **System Date**

选择此选项，用< + > / < - >来设置目前的日期。以月/日/年的格式来表示。各项目合理的范围是：Month/月(Jan.-Dec.)， Date/日(01-31)，Year/年(最大至 2099)， Week/星期(Mon.～ Sun.)。

◆ **Advanced**

BIOS SETUP UTILITY	
Advanced Settings	Configure CPU
WARNING:Setting wrong values in below sections may cause system to malfunction ►CPU Configuration ►IDE Configuration ►Super I/O Configuration ►Hardware Health Configuration ►USB Configuration ►Power Management Configuration ►Clock Generator Configuration	←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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➢ **CPU Configuration**

BIOS SETUP UTILITY	
Configure advanced CPU settings Brand String: Intel(R) Atom(TM) CPU K510 @ 1.66GHz Frequency; :1.66GHz FSB Speed; :667MHz Cache L1; :48 KB Cache L2; :1024 KB Ratio Actual Value :10 Hyper Threading Technology [Enabled] Intel(R) SpeedStep(tm) tech [Enabled]	←→ Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.57 (c)Copyright 1985-2004, American Megatrends, Inc	

- **Hyper Threading Technology**

  Intel Hyper Threading Technology功能的控制开关。

- **Intel(R) SpeedStep(tm) tech**

  Intel(R) SpeedStep(tm) tech功能的控制开关。

➢ **IDE Configuration**

BIOS SETUP UTILITY		
IDE Configuration		
ATA/IDE Configuration	[Enhanced]	
Configure SATA as	[IDE]	
		←→ Select Screen
		↑ ↓ Select Item
▶Primary IDE Master	:[Not Detected]	+ - Change Field
▶Primary IDE Slave	:[Not Detected]	Tab Select Field
▶Secondary IDE Master	:[Not Detected]	F1 General Help
▶Secondary IDE Slave	:[Not Detected]	F10 Save and Exit
▶Third IDE Master	:[Not Detected]	ESC Exit
▶Third IDE Slave	:[Not Detected]	
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- **ATA/IDE Configuration**

此选项用来配置ATA的工作模式，Enhanced和Compatible分别对应增强模式和兼容模式。

- **Configure SATA as**

SATA控制器的类型选择，对应IDE和AHCI选择项，仅在ATA/IDE Configuration为增强模式时才支持AHCI。

AHCI功能同时需要硬件芯片和操作系统支持。

- **Legacy IDE Channels**

配置兼容模式下IDE通道类型，对应SATA Only，SATA Pri，PATA Sec和PATA Only选择项。

- **Primary～Third IDE Master/Slave**

＊Type

Not Installed：系统没有检测到IDE设备

AUTO：系统开机自动检测IDE参数

CD/DVD：用于ATAPI CDROM

ARMD：用于各种模拟IDE设备

＊LBA/Large Mode

用于设置是否支持LBA模式。

＊Block(Multi-sector Transfer)

用于设置是否支持多扇区同时传输的功能。

＊PIO Mode

用于PIO模式设置。

＊DMA Mode

用于DMA模式设置。

＊S.M.A.R.T

此选项用于设置是否启用硬盘S.M.A.R.T功能，只对支持该功能的硬盘有效。

＊32Bit Data Transfer

此选项用于使能32位的硬盘访问模式，可以使硬盘读写速度达到最佳。

- **AHCI Port0～2**

AHCI 端口配置菜单，仅在SATA控制器配置成AHCI或RAID时显示。

＊SATA Port0～2

Auto：系统开机自动检测SATA设备。

Not Installed：关闭该端口，不做检测。

＊S.M.A.R.T

此选项用于设置是否启用硬盘S.M.A.R.T功能，只对支持该功能的硬盘有效。

➢ **Super I/O Configuration**

BIOS SETUP UTILITY		
Configure Super I/O Chipset		Allows BIOS to Enable or Disable Floppy Controller.
OnBoard Floppy Controller	[Enabled]	
Serial Port1 Address	[3F8]	
Serial Port1 IRQ	[4]	
Serial Port2 Address	[2F8]	
Serial Port2 IRQ	[4]	
Serial Port3 Address	[3E8]	
Serial Port3 IRQ	[3]	
Serial Port4 Address	[2E8]	
Serial Port4 IRQ	[3]	
Serial Port5 Address	[2F0]	
Serial Port5 IRQ	[10]	
Serial Port6 Address	[2E0]	
Serial Port6 IRQ	[10]	
Serial Port7 Address	[200]	←→ Select Screen
Serial Port7 IRQ	[11]	↑ ↓ Select Item
Serial Port8 Address	[208]	+ - Change Field
Serial Port8 IRQ	[11]	Tab Select Field
Serial Port9 Address	[210]	F1 General Help
Serial Port9 IRQ	[11]	F10 Save and Exit
Serial Port10 Address	[218]	ESC Exit
Serial Port10 IRQ	[11]	
Parallel Port Address	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	
Uart IRQ Attribute	[Edge Active High]	
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- **OnBoard Floppy Controller**

  用于使能软驱控制器。

- **Serial Port n Address**

  设定主机板上串口n的地址（n=1…10）。

- **Serial Port n IRQ**

  设定主机板上串口n的中断（n=1…10）。

- **Parallel Port Address**

  设定主机板上并口的地址，地址缺省值为378。

- **Parallel Port Mode**

  设定主机板上并口的模式。

- **Parallel Port IRQ**

  设定主机板上并口的中断。

- **Uart IRQ Attribute**

  设定串口7-10的中断属性。

➢ **Hardware Health Configuration**

BIOS SETUP UTILITY		
Hardware Health Configuration		Enables Hardware Health Monitoring Device
System Temperature	: 30℃/86℉	
CPU Temperature	: 37℃/98℉	
SYSFAN1		
CPUFAN1		
		←→ Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Vcore	: 1.136 V	
V3.3	: 3.296 V	
V5.0	: 5.094 V	
V12.0	: 12.196 V	
VBAT	: 3.152 V	
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- **System Temperature**

  当前系统温度，一般主板上有热敏电阻监测。

- **CPU Temperature**

  当前CPU温度。CPU的温度由板上的温度传感器监测。

- **Vcore**

  CPU核心电压。

- **V3.3/ V5.0/ V12.0**

  开关电源输出电压。

- **VBAT**

  电池电压监测

➢ **USB Configuration**

BIOS SETUP UTILITY		
USB Configuration		Enables USB host controllers.
USB Devices Enabled :		
1 Keyboard, 1 Drive		
USB Function	[8 USB Ports]	←→ Select Screen
USB 2.0 Controller	[Enabled]	↑ ↓ Select Item
Legacy USB Support	[Auto]	+ - Change Field
▶USB Mass Storage Device Configuration		F1 General Help F10 Save and Exit ESC Exit
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- **USB Function**

  此选项设置USB控制器的数量，即确定支持几个USB控制器，通常一个控制器有两个USB接口。

- **USB 2.0 Controller**

  此选项用来选择是否支持USB 2.0 控制器。

- **Legacy USB Support**

  此选项用于支持传统的USB设备（键盘，鼠标，存储设备等），当该项设为Enabled时，即使不支持USB的操作系统如DOS下也能使用USB设备。

- **USB Mass Storage Device Configuration**

  此选项用于配置USB块存储设备，其中包括Reset 延时设置及枚举类型。

➢ **Power Management Configuration**

BIOS SETUP UTILITY		
Power Management Configuration		
ACPI APIC Support	[Enabled]	←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
Restore on AC Power Loss	[Last state]	
Resume on RTC Alarm	[Disabled]	
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- **ACPI APIC Support**

  此选项用于打开或关闭ACPI OS下的APIC（高级中断控制器）。

- **Restore on AC Power Loss**

  使用该选项可以设置计算机在交流电停电而后再来电时系统所处状态。“Power Off”，让系统处于关机状态，“Power On”，系统自动开启，“Last State”，则保持到断电前的状态。

- **Resume on RTC Alarm**

  此项用来打开或关闭系统闹钟，当到达指定时间时，会将系统从节电模式甚至关机状态唤醒，该功能必须有ATX电源的支持。

➢ **Clock Generator Configuration**

BIOS SETUP UTILITY	
Configure Clock Generator	
Spread Spectrum [Enabled]	
Auto PCI Clock [Enabled]	
	←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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- **Spread Spectrum**

  此选项用来控制时钟信号的展频功能。

- **Auto PCI Clock**

  此选项用来实现PCI槽上设备的自动侦测，如果槽上无设备，则关闭该槽对应的时钟信号。

◆ **Chipset**

BIOS SETUP UTILITY		
Advanced Chipset Settings		
WARNING: Setting wrong values in below sections may cause system to malfunction.		
North Bridge Chipset Configuration		
DRAM Frequency	[Auto]	
Configure DRAM Timing by SPD	[Enabled]	←→ Select Screen
Initiate Graphic Adapter	[PCI/IGD]	↑ ↓ Select Item
Boot Display Device	[CRT+LVDS]	Enter Go to Sub Screen
LVDS Color Depth	[24BIT]	F1 General Help
Flat Panel Type	[800x600/S/18/G104S]	F10 Save and Exit
UserDefine Panel Type	[Disabled]	ESC Exit
South Bridge Chipset Configuration		
PXE Boot	[Disabled]	
Onboard Audio Controller	[Enabled]	
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➢ **DRAM Frequency**

配置DRAM的频率，此处建议使用自动，手动更改配置可能会因为DRAM不支持而不开机。

➢ **Configure DRAM Timing by SPD**

BIOS按照SPD芯片上的内容配置SDRAM内存的时序。绝大多数内存条上有一个保存内存时序和容量等参数的一个小芯片，即SPD芯片。

➢ **Initiate Graphic Adapter**

此选项用于指定优先启动的显示设备类型。

➢ **Boot Display Device**

此选项用于选择开机默认的显示输出设备。

- **LVDS Color Depth**

  此选项用于选择LVDS的色深。

- **Flat Panel Type**

  此选项用于选择Flat Panel的分辨率。

- **UserDefine Panel Type**

  可以根据用户自定义配置平板显示类型。

- **PXE Boot**

  此选项用于选择是否打开网络启动功能。

- **Onboard Audio Controller**

  选择是否打开声卡控制器。

◆ **PCIPnP**

BIOS SETUP UTILITY		
Advanced PCI/PnP Settings		
WARNING:Setting wrong values in below sections may cause system to malfunction.		
IRQ3	[Available]	←→ Select Screen
IRQ4	[Available]	↑ ↓ Select Item
IRQ5	[Available]	+ - Change Field
IRQ7	[Available]	F1 General Help
IRQ9	[Available]	F10 Save and Exit
IRQ10	[Available]	ESC Exit
IRQ11	[Available]	
IRQ14	[Available]	
IRQ15	[Available]	
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- **IRQ3～15**

  此系列选项用以指定对应IRQ号是PNP方式还是保留给ISA使用。

◆ **Boot**

BIOS SETUP UTILITY		
Boot Settings		←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Quick Boot	[Enabled]	
Quiet Boot	[Disabled]	
Waite For ‘F1’ If Error	[Enabled]	
Boot Device Priority		
Boot from Embedded WinCE	[No]	
1st Boot Device	[USB:aigo USB DISK]	
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- **Quick Boot**

  配置在BIOS引导期间是否允许跳过某些项的测试， 减少BIOS引导时间。

- **Quiet Boot**

  配置是否显示OEM LOGO内容。

- **Wait For ‘F1’ If Error**

  配置在系统出错时是否提示按”F1”键。

- **Boot from Embedded WinCE**

  配置从WinCE系统引导。

- **1st～4th Boot Device**

  配置系统启动时优先权高低的启动设备。

◆ **Security**

BIOS SETUP UTILITY	
Security Settings	Install or Change the password
Supervisor Password :Not Installed	
User Password :Not Installed	←→ Select Screen ↑ ↓ Select Item
Change Supervisor Password	Enter Change
Change User Password	F1 General Help F10 Save and Exit ESC Exit
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➢ **Change User/ Supervisor Password**

当按Change User/ Supervisor Password后，在对话框中输入新的密码后，此栏会显示用户密码已安装。

◆ **Exit**

South Bridge Configuration	
Exit Options	Exit system setup after saving the changes.
Save Changes and Exit Discard Changes and Exit Discard Changes	←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen
Load Optimal Defaults Load Failsafe Defaults	F1 General Help F10 Save and Exit ESC Exit
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➢ **Save Changes and Exit**

当您完成了所有的修改操作，想将原来的设置参数覆盖掉时，可执行此项功能，新的设置参数将保存在CMOS的存储器中。要执行此操作，先选定此选项并按下< Enter >键，再按< Enter >键即可可退出。

- **Discard Changes and Exit**

当您所做的任何更改设置的动作不想存入CMOS的存储器中，可先选定此选项并按下< Enter >键，再按<Enter >键即可退出。

- **Discard Changes**

当您所做的任何更改设置的动作有误而需要忽略时，可先选定此选项并按下< Enter >键，然后可以再次进入相应选项进行重新设置。

- **Load Optimal Defaults**

此菜单用于在你的系统配置中装入缺省值。这些缺省设置是最优的，可以发挥所有硬件的高性能。

- **Load Failsafe Defaults**

该选项的功能是将各项设置初始化为实现最基本的和最安全的系统功能的值。要执行此项功能，先选中此选项按下< Enter >即可，接着系统会在屏幕上显示出要您确认的信息，按下< Enter >键确定执行该项功能。

x86 平台下BIOS所要管理的系统资源

这里的系统资源我们定义三种：I/O端口地址，IRQ中断号和DMA号。

◆ DMA

级别	功能
DMA0	DRAM 刷新
DMA1	未分配
DMA2	未分配
DMA3	未分配（有时用于硬盘）
DMA4	用于 DMAC 的级联
DMA5	未分配
DMA6	未分配
DMA7	未分配

◆ APIC

高级可编程中断控制器。在现代P4以上级别的主板中，大都支持APIC，可以提供多于16个中断源，如IRQ16—IRQ23，部分主板如支持PCI-X的主板可以有多达28个中断源。但要启用该功能必须相应的操作系统支持，目前只有windows 2000以上的操作系统支持。

◆ IO端口地址

系统I/O地址空间总共有64K，每一外围设备都会占用一段I/O地址空间。下表给出了本CPU卡部分设备的I/O 地址分配，由于PCI设备（如PCI网卡）的地址是由软件配置的，表中没有列出。

地 址	设备描述
000h - 00Fh	DMA 控制器#1
020h - 021h	可编程中断控制器#1
040h - 043h	系统计时器
060h - 064h	标准 101/102 键盘控制器
070h - 071h	实时时钟,NMI
080h - 09Fh	DMA 页寄存器
0A0h - 0A1h	可编程中断控制器#2
0C0h - 0DFh	DMA 控制器#2
0F0h - 0FFh	数据数值处理器
1F0h - 1F7h	主要 IDE 通道
200h - 207h	串行端口 #7(COM7)
208h - 20Fh	串行端口 #8(COM8)
210h - 217h	串行端口 #9(COM9)
218h - 21Fh	串行端口 #10(COM10)
274h - 279h, A79h	PnP 组态寄存器端口
2E0h - 2E7h	串行端口 #6(COM6)
2E8h - 2EFh	串行端口 #4(COM4)
2F0h - 2F7h	串行端口 #5(COM5)
2F8h - 2FFh	串行端口 #2(COM2)
378h - 37Fh	并行端口#1(LPT1)
3B0h - 2BBh	Intel(R) Graphics Media Accelerator 3150
3C0h - 2DFh	Intel(R) Graphics Media Accelerator 3150
3E8h - 3EFh	串行端口 #3(COM3)
3F6h - 3F6h	主要 IDE 通道
3F8h - 3FFh	串行端口#1(COM1)
400h - 41Fh	SMBus 控制器

◆ **IRQ中断分配表**

系统共有15个中断源，有些已被系统设备独占。只有未被独占的中断才可分配给其它设备使用。ISA设备要求独占使用中断；只有即插即用ISA设备才可由BIOS或操作系统分配中断。而多个PCI设备可共享同一中断，并由BIOS或操作系统分配。下表给出了X86平台部分设备的中断分配情况，但没有给出PCI设备所占用的中断资源。

级别	功能
IRQ0	系统计时器
IRQ1	标准 101/102 键或 Microsoft 键盘
IRQ2	可编程的中断控制器
IRQ3	串口#3-#4
IRQ4	串口#1-#2
IRQ5	保留
IRQ6	保留给软驱控制器
IRQ7	并口
IRQ8	系统 CMOS/实时时钟
IRQ9	ACPI
IRQ10	串口#5-#6
IRQ11	串口#7-#10
IRQ12	PS/2 鼠标
IRQ13	数学协处理器
IRQ14	主 IDE
IRQ15	保留

第四章　驱动程序安装说明

本产品的驱动程序可依据配套光盘内容安装，在此不做介绍。

附录

Watchdog编程指引

本主板提供一个可按分或按秒计时的，最长达255级的
可编程看门狗定时器(以下简称WDT)。通过编程，WDT超时事件可用来
将系统复位或者产生一个可屏蔽中断。

本主板可使用的中断号为：3，4，5，7，9，10，11。

使用前请把BIOS Setup界面PCIPnP组中对应的IRQ号选项值改成Reserved。

以下用C语言形式提供了WDT的编程范例，对WDT的编程需遵循以下步骤：

进入WDT编程模式
设置WDT工作方式/启动WDT/关闭WDT

(1) **进入WDT编程模式**

```
#define INDEX_PORT     0x2E
#define DATA_PORT      0x2F

outportb(INDEX_PORT,0x87);
outportb(INDEX_PORT,0x01);
outportb(INDEX_PORT,0x55);
outportb(INDEX_PORT,0x55);
outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x07);
```

(2) **设置WDT工作方式，复位或中断方式，选择一种：**

a. **配置WDT成复位工作方式**

```
outportb(INDEX_PORT,0x72)
outportb(DATA_PORT,00);
outportb(INDEX_PORT,0x72);
 int val=inportb(DATA_PORT);
 val |=0x40;
outportb(DATA_PORT, val);
```

b. **配置WDT成中断工作方式**

```
outportb(INDEX_PORT,0x72)
outportb(DATA_PORT,IRQ_ NO); /*此处请用需要使用的中断号替换掉常量
IRQ_NO，文档前端已经列出可使用中断号的范围*/
outportb(INDEX_PORT,0X72);
int val=inportb(DATA_PORT);
val&=0xBF;
outportb(DATA_PORT, val);
```

(3) **配置WDT按分或秒计时：**

a. **按分计时：：**

```
val &=0x7f;
outportb(INDEX_PORT, 0x72);
outportb(DATA_PORT,     val);
```

b.**按秒计时：**

```
val |=0x80;
outportb(INDEX_PORT, 0x72);
outportb(DATA_PORT,     val);
```

(4) **启动/禁止WDT**

a. **启动WDT：**

```
outportb(INDEX_PORT,0x73);
outportb(DATA_PORT,TIME_OUT_VALUE); /*请以超时时间单位数量
(0x01~0xFF)替换掉常量TIME_OUT_VALUE*/
```

b. **停止WDT：**

```
outportb(INDEX_PORT,0xf6);
outportb(DATA_PORT,0x00);
```

数字IO编程指引

本主板提供8路可编程数字I/O引脚，其中4路为输入，4路为输出。

以下用C语言形式提供了数字I/O的编程范例，对数字I/O的编程需遵循以下步骤：

初始化数字I/O

输入输出编程

(1) 初始化数字I/O:

```
#define  BAR  0x400

unsigned char tmp_val;
outportb(BAR,0xbf);
outportb(BAR+0x04,0x40);
outportb(BAR+0x03,0x03);
outportb(BAR+0x05,0x0F);
tmp_val =(inportb(BAR+0x02)|0x08)&0xeb;
tmp_val |= 0x40;
outportb(BAR+0x02, tmp_val);
delay(30);
tmp_val =inportb(BAR);
while((tmp_val &0x02)!=0x02)
     {
          tmp_val =inportb(BAR);
          if((tmp_val &0x04)!=0)
          {
               printf("ERROR\n");
               return 0;
          }
     }
```

(2) **输入输出编程：**

a. **输出编程**

函数输入： int pin - 取值1~4分别对应输出引脚1~4

int lev_val - 1为输出高电平，0为输出低电平

函数输出：无

```
void Out_Lev(int pin ,int lev_val)
  {
    unsigned int reg_val ;
    outportb(BAR,0xbf);
    outportb(BAR+0x04,0x40);
    outportb(BAR+0x03,0x01);
    reg_val = inportb(BAR+0x05);
    reg_val = lev_val ?
reg_val|(0x01<<pin+3) :reg_val&(~(0x01<<pin+3)) ;
    outportb(BAR+0x05, reg_val);
    reg_val =(inportb(BAR+0x02)|0x08)&0xeb;
    reg_val |= 0x40;
    outportb(BAR+0x02, reg_val);
    delay(30);
    reg_val =inportb(BAR);
    while((reg_val &0x02)!=0x02)
        {
            reg_val =inportb(BAR);
            if((reg_val &0x04)!=0)
            {
                printf("ERROR\n");
                return 0;
            }
        }
}
```

b. **输入编程**

函数输入：int pin - 取值1~4分别对应输入引脚1~4

函数输出：int lev_val - 1: 输入引脚为高电平，0: 输入引脚为低电平

```
int In_Lev(int pin)
{
     unsigned int reg_val ;
     int lev_val ;
     outportb(BAR,0xbf);
     outportb(BAR+0x04,0x41);
     outportb(BAR+0x03,0x00);
     reg_val =(inportb(BAR+0x02)|0x08)&0xeb;
     reg_val |= 0x40;
     outportb(BAR+0x02, reg_val);
     delay(30);
     reg_val =inportb(BAR);
     while((reg_val &0x02)!=0x02)
          {
               reg_val =inportb(BAR);
               if((reg_val &0x04)!=0)
               {
                    printf("ERROR\n");
                    return 0;
               }
          }
lev_val = inportb(BAR+0x05)&( 0x01<<pin-1);
lev_val = lev_val ? 1:0; /*此处得到变量lev_val的值，为1表示输入引脚
为高电平，为0表示输入引脚为低电平*/
          return lev_val ;
      }
```

常见故障分析与解决

序号	故障现象	故障分析解决
1	BIOS 设置不能保存	分析：可能是 CMOS 电池的问题。
		解决方法：用万用表测量 CMOS 电池，电压不足就更换新电池，重新设置保存。
2	时可开机时不可开机	分析：可能是电源接触不良，从主板电源插座上拔下电源，发现主板电源插针某根插针经多次用力插压，已经倒向一边。
		解决方法：关机拔下电源插头，用镊子将弯曲的电源插针弄直插上电源开关，重新启动，多次试验，没有出现此类故障。
3	当接上U盘时，系统提示一个高速设备接到一个低速接口上。	分析：U 盘是高速 USB2.0，接到电脑上有提示一个高速设备接到一个低速接口上，说明主板的接口被认为是一个 USB1.1 的接口。
		解决方法：将主板上 USB 高速传输模式打开即可。不同的主板有不同的设置。一般是将 USB 设备选项中的 FULLSPEED 改为 HISPEED 即可。
4	更换新内存后屏幕无显示，呈现黑屏状态，无法正常进入系统，换上原来的内存仍然无法启动。	分析：可能是由于在插拔内存的过程中操作不当引起主板上部件工作不正常，需要重点检查主板上与内存相关的电路。
		解决方法：首先检查内存、显卡等硬件，结果显示这些硬件都没有问题，都可以正常使用。仔细检查主板上内存插槽周围的电路，最终发现第一个内存插槽里的两根与内存金手指接触的针脚搭在一起，对照第二个内存插槽没有该现象，由此判断是第一个内存插槽短路了。用镊子小心地将两根针脚拨回原处，插上内存，重新启动，系统顺利启动。

5	更换光驱后系统无法启动	分析：可能是由于在安装光驱时不小心碰撞了硬盘的数据线，从而使硬盘数据线接口接触不良导致的，或者是硬盘和光驱上的主从跳线设置不正确。
		解决方法：首先对硬盘数据线和硬盘及主板上的 IDE 接口进行检查，发现没有问题；然后检查主从跳线的设置，发现硬盘和光驱连接在不同的数据线上，而且硬盘和光驱的跳线都设置为主盘，从而导致硬盘无法启动；将光驱的跳线设置为从盘，重新安装好。
6	进入系统后无法检测到 PCI 卡	分析：确认 PCI 卡功能是否正常；将 PCI 卡重插或插入其他 PCI 插槽，看能否正常；了解使用的电源类型（是 AT 还是 ATX）；了解客户的 PCI 卡的电压需求。
		解决方法：如 PCI 卡功能问题，更换 PCI 卡解决；重插或插入其他 PCI 插槽即可正常，则为 PCI 卡与插槽接触问题。如果使用的是 AT 电源，但 PCI 卡需要 3.3V 电压，因为 AT 电源不提供 3.3V 电压，电源需更换为 ATX 电源方可使用 PCI 卡。（建议：在选购电源时，先了解所使用的 PCI 卡是否需要 3.3V 电压。）
7	找不到外接设备	分析：没有连接；没有装驱动；设备已坏。
		解决方法：查看设备与主板的连接线是否正常，如正常则更换正常连接线确定连接无问题；重新安装设备驱动，看是否可以识别；检测设备是否正常；如设备正常考虑与主板是否兼容。

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Or send to the Technical Support Mailbox support@evoc.com or support@evoc.cn for consultation.

Safety Instructions

1. Please read this manual carefully before using the product;
2. Leave the board or card in the antistatic bag until you are ready to use it;
3. Touch a grounded metal object (e.g. for 10 seconds) before removing the board or card from the anti-static bag;
4. Before installing or removing a board, wear the ESD gloves or ESD wrist strap; handle the board by its edges only;
5. Before inserting, removing or re-configuring motherboards or expansion cards, first disconnect the computer and peripherals from their power sources to prevent electric shock to human bodies or damage to the product;
6. Remember to disconnect the AC power cord from the socket before removing the board or moving the PC;
7. For PC products, remember to disconnect the computer and peripherals from the power sources before inserting or removing a board;
8. Before connecting or disconnecting any terminal, peripheral or any device, be sure the system is powered off and all the power sources are disconnected;
9. After turning off the computer, wait at least 30 seconds before turning it back on

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Chapter 1 Product Introduction

Overview

The product is an embedded Mini-ITX single board based on Intel® Luna Pier Refresh platform.

The board adopts the technique scheme of Intel® Atom™ D510/D410 processor + Intel® ICH8M on-board. It provides one SO-DIMM DDR2 slot on-board up to 2GB. It supports three display modes: VGA, 24-bit LVDS and DVI; two 10/100/1000M Ethernet controllers; eight USB2.0 ports; two SATA hard disk connectors; one IDE connector, one Type I/II CF connector; one HD Audio connector; six or ten serial ports (one supports RS-232/ RS-485, two support power supply); one PS/2 KM connector; one PCI slot; the board adopts the standard ATX power supply or 12V single power supply.

The product adopts Intel® low power consumption solution and supports multi-COM, power supply on serial port, VGA+LVDS dual display, PCI expansion and so on. It can satisfy the industrial requirements of POS and lottery machines; besides, it can be used in advertising machines, information kiosks, self-service terminals and other applications which do not require high performance of the motherboard.

Mechanical Dimensions, Weight and Environment

- Dimensions: 170mm (L) x 177.9mm (W) x 41.5mm (H);
- Net Weight: 0.436 Kg;
- Operating Environment:

  Temperature: -10°C ~ 60°C;

  Humidity: 5% ~ 95% (non-condensing);
- Storage Environment:

  Temperature: -40°C ~ 75°C;

  Humidity: 5% ~ 95% (non-condensing);

Typical Consumption

The typical consumption is based on the following idle status values.

1. The typical power consumption for EC7-1813CLD2NA-D4V10COM is as follows:

   CPU: Onboard Intel® Atom™ D410 1.66GHz (166*10/L2=512K)

   Memory: Transcend DDRII 800 2GB

   Hard Disk: HITIACH 2TB SATA HDD

   - +12V@1.55A; +5%/-3%;

2. The typical power consumption for EC7-1813CLD2NA-D5 is as follows:

   CPU: Intel® Atom™ D510

   Memory: DDRII800 2GB Kingston

   Hard Disk: Seagate 500GB SATA

   - +3.3V@0.62A; +5%/-3%;
   - +5V@1.15A; +5%/-3%;
   - +12V@0.52A; +5%/-3%.

Microprocessor

Intel® Atom™ D510 (Dual Core) /D410 (Single Core) processor on-board, integrated memory controller and graphics controller.

Chipset

Intel® Atom™D510/D410 processor + Intel® ICH8M

System Memory

Provides one 200-Pin SO-DIMM DDR2 memory slot, supporting Un-buffered Non-ECC memory up to 2GB; the memory frequency supported is up to 667MHz.

Display Function

- Adopts CPU with integrated graphics controller;

- Supports VGA, single-channel 24-bit LVDS and DVI display, among which 24-bit LVDS and DVI are homological inputs and the LVDS and DVI are output in Clone mode; supports VGA + LVDS (or DVI) output in Clone or expansion mode; supports three display modes and hot-swap function.
- The maximum resolution and refresh frequency supported by VGA is up to 2048×1536@60Hz while the maximum resolution supported by LVDS is up to 1366×768; The maximum resolution supported by DVI is up to 1600×1200.

Network Function

Provides two 10/100/1000Mbps LAN ports: LAN1 supports Wake-on-LAN function while LAN1 supports LAN PXE booting.

Audio Function

Adopts HD standard, supporting MIC-IN/LINE-IN/LINE-OUT.

Power Feature

Adopts ATX/AT power: ATX power supports ACPI1.0b specification and the status of S0, S1, S4 and S5; AT power supports single 12V power supply.

Expansion Bus

Provides one PCI slot, complying with PCI 2.3 standard.

Watchdog Function

- 255 levels, programmable by minute or second;
- Watchdog timeout interrupt or reset system.

Operating System

Supported OSs: Windows XP, Windows 2000 and Linux.

On-board I/O

- One parallel port, supporting SSP/EEP/ECP operating modes and BIOS modifies operating mode;
- Ten serial ports: COM2 supports RS-232/RS-485 mode selection; COM1 supports Modem wake-up function; COM3 and COM4 support 5V/12V power output;
- One IDE connector;
- One CF card connector;
- Two SATA connectors, supporting hot-swap function;
- Eight USB2.0 ports: USB1 ~ USB4 are brought out via connectors directly; USB5 ~ USB8 are brought out in 2x5Pin headers;
- Two PS/2 keyboard/mouse connectors: one is a standard connector and the other a pin header;
- One 8-channel digital I/O connector.

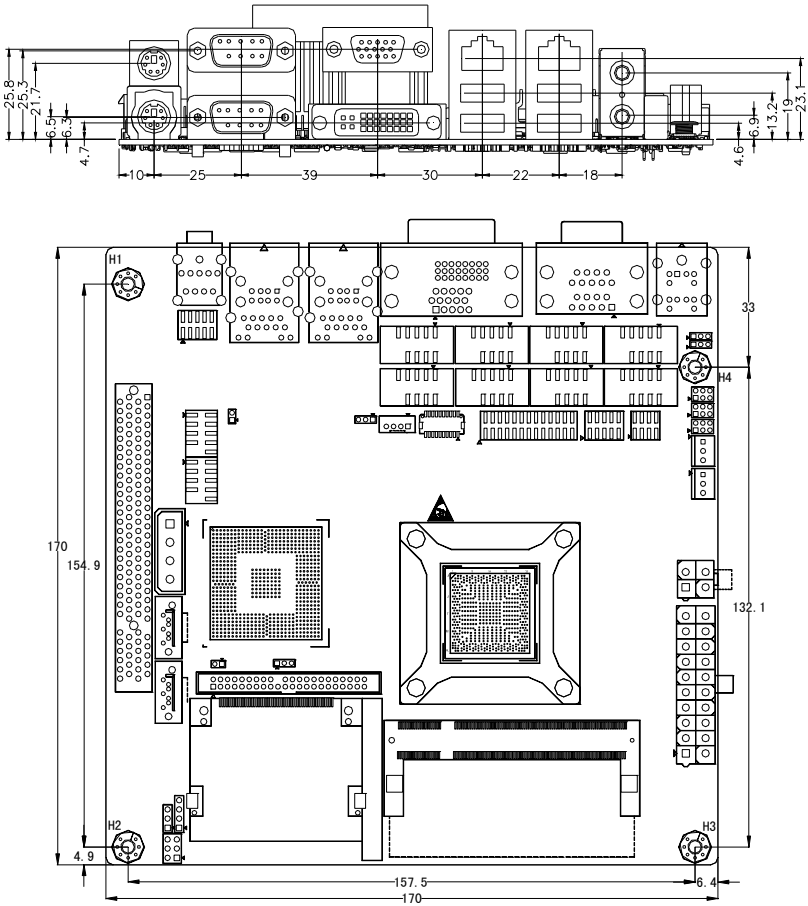
Tips: how to identify the alarms

1. Long “beep” indicates a system memory error;

2. Short beep indicates to power on the computer.

Chapter 2 Installation

Product Outline

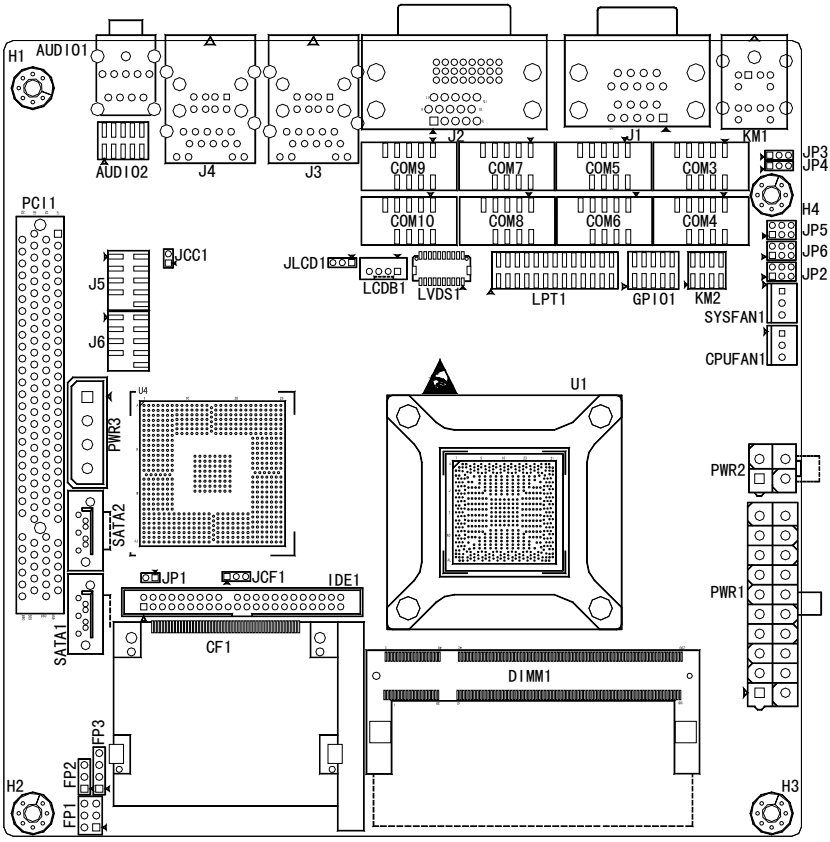


Unit: mm

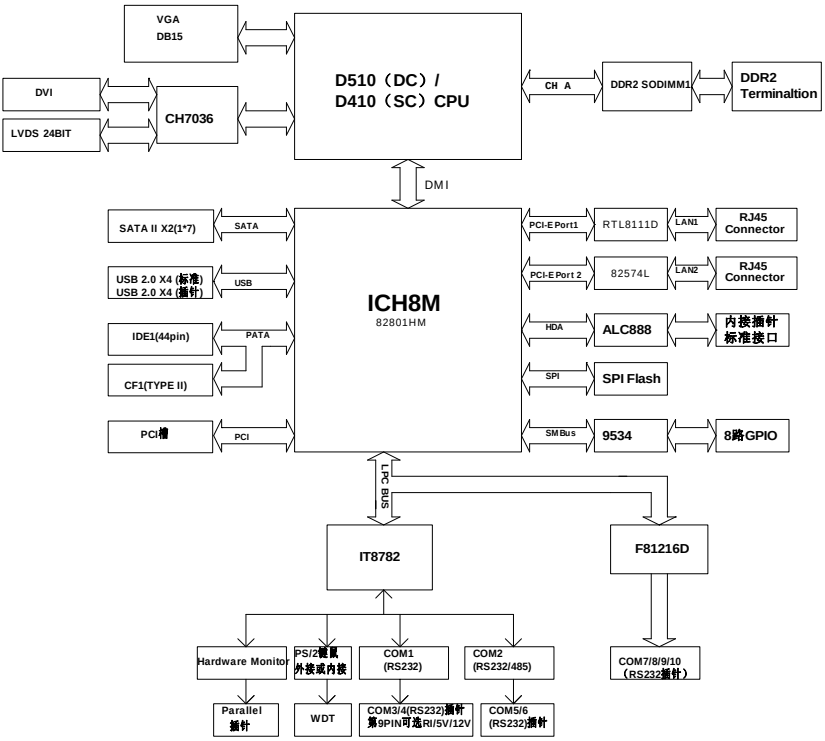
Warning!

Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation, etc); otherwise, the board may be damaged. It is recommended to use M3x6 GB9074.4-88 screws at H1 ~ H4.

Locations of Connectors



Structure



Tip: How to identify the first pin of the jumpers and connectors

1. Observe the letter beside the socket, it would be marked with “1” or bold lines or triangular symbols;
2. Observe the solder pad on the back; the square pad is the first pin.

Jumper Setting

1. JCC1: Clear/Keep CMOS Setting (Pitch: 2.0mm)

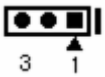
CMOS is powered by the button battery on board. Clearing CMOS will restore original settings (factory default). The steps are listed as follows: (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when booting the computer, load optimized defaults; (5) Save and exit. Please set as follows:

JCC1

Setup	Function
1-2 Open	Normal (Default)
1-2 Short	Clear the contents of CMOS and all BIOS settings will restore to factory default values.

2. JLCD1: Select LCD Operating Voltage (Pitch: 2.0mm)

Different LCD screens have different voltages; the board provides two voltage options, +3.3V and +5V. Only when the selected LCD screen voltage is in accord with the LCD screen operating voltage in use, can the LCD screen operate normally. Please set as follows:

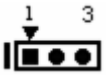


JLCD1

Setup	Function
1-2 Short	+3.3V(Default)
2-3 Short	+5V

3. JCF1: Select CF Card Operating Voltage (Pitch: 2.0mm)

Different CF cards have different voltages; the board provides two voltage options, +3.3V and +5V. Only when the selected CF card voltage is in accord with the CF card operating voltage in use, can the system stability be ensured. Please set as follows:



JCF1

Setup	Function
1-2 Short	+3.3V
2-3 Short	+5V(Default)

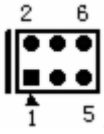
Note: CF card voltage selection are set to comply with different CF cards; as for the CF cards without specified operating voltages, please choose the operating voltage according to actual usage.

4. JP1: Select Mater and Slave Mode for CF Card (Pitch: 2.0mm)

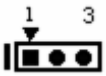
JP1

Setup	Function
1-2 Short	Master
1-2 Open	Slave(Default)

5. JP2 ~ JP4: COM2 Select Mode for Serial Port (Pitch: 2.0mm)



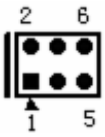
JP2



JP3 ~ JP4

Pin Setting	Mode Selection	
	RS-232 (Default)	RS-485
JP2	1-2	3-4
JP3	1-2	2-3
JP4	1-2	2-3

6. JP5 ~ JP6: Pin 9 Function Selection for COM3/COM4 (Pitch: 2.0mm)



JP5/JP6

Pin Setting	Pin9 Function Selection for COM3/COM4		
	RI#(Default)	VCC5V	VCC12V
JP5	1-2	3-4	5-6
JP6	1-2	3-4	5-6

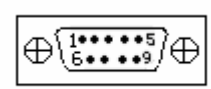
Install the System Memory

The board is configured with one 200Pin DDRII SO-DIMM slot (DIMM1). When installing the memory bank, please pay attention to the following issues:

- Open the buckles on both sides of the memory slot. When installing, align the notch of the memory bank with that of the memory slot and gently insert the module into the slot;
- The memory of 1.8V DDRII 667MHz supported by Intel® Chipset can be used; the maximum memory capacity supported by the board is up to 2GB;
- It is recommended to use the memory bank with SPD to ensure stable operation.

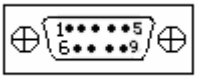
Serial Port

The board provides two standard DB9 serial ports: COM1 supports Modem wake-up function and RS-232 mode; COM2 supports RS-232/RS-485 mode selection; it also provides eight 2x5Pin serial ports (Pitch: 2.54mm) of RS-232 mode. The pin definitions are as follows:



J1(COM1)

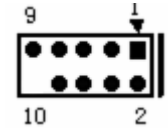
Pin	Signal Name
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#



J1(COM2)

Pin	Signal Name	
	RS-232	RS-485
1	DCD#	Data-
2	RXD	Data+
3	TXD	NC
4	DTR#	NC
5	GND	GND
6	DSR#	NC
7	RTS#	NC
8	CTS#	NC
9	RI#	NC

Note: the data transmission direction of COM2 is controlled automatically under RS-485 mode.



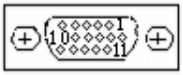
COM3 ~ COM10

Pin	Signal Name
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#
10	NA

Display Connector

The board provides a set of 24-bit single channel LVDS connector and one VGA+DVI-D dual layer connector (Marked as J2 on-board: DVI connector for the upper layer while VGA connector for the lower layer). The pin definitions are as follows:

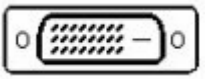
1. VGA Connector



J2(VGA)

Pin	Signal Name	Pin	Signal Name
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

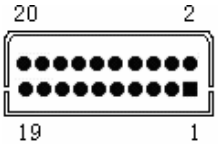
2. DVI-D Connector



J2(DVI)

Pin	Signal Name	Pin	Signal Name
1	DATA2-	13	NC
2	DATA2+	14	+5V
3	GND_DVI	15	GND
4	NC	16	HOTPLUG
5	NC	17	DATA0-
6	DDCCLK	18	DATA0+
7	DDCDATA	19	GND_DVI
8	NC	20	NC
9	DATA1-	21	NC
10	DATA1+	22	GND_DVI
11	GND_DVI	23	CLK+
12	NC	24	CLK-

3. Single-channel 24-bit LVDS Connector



LVDS1

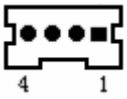
(Pitch: 1.0mm)

Pin	Signal Name	Pin	Signal Name
1	LVDS_D0+	2	LVDS_D0-
3	GND	4	GND
5	LVDS_D1+	6	LVDS_D1-
7	GND	8	GND
9	LVDS_D2+	10	LVDS_D2-
11	GND	12	GND
13	CLK+	14	CLK-
15	GND	16	GND
17	LVDS_D3+	18	LVDS_D3-
19	VDD	20	VDD

Note: The LVDS socket adopted by the board is DF20G-20DP-1V while the corresponding terminal type is DF20A-20DF-1C.

LCD Backlight Control Connector

The board provides one 1x4Pin LCD backlight control connector (Pitch: 2.0mm); the pin definitions are as follows:



LCDB1

Pin	Signal Name
1	VCC_LCDBKLT
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

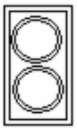
Note: VCC_LCDBKLT---+12V backlight power (The current is limited below 1A);

LCD_BKLTCTL--- backlight control (The signal is output as PWM signal via Pineview D; the voltage amplitude is between 0V-3.3V while the duty cycle is between 0% ~ 100%);

LCD_BKLTEN ---- backlight enable, active high.

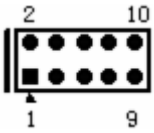
Audio Connector

The board provides one dual layer Audio connector and one 2x5Pin AUDIO pin header.



AUDIO1

Pin	Signal Name
1	LINE_OUT
2	MIC_IN



AUDIO2

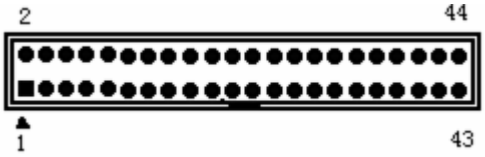
(Pitch: 2.0mm)

Pin	Signal Name	Pin	Signal Name
1	LOUT_R	2	LOUT_L
3	GND_AUDIO	4	GND_AUDIO
5	LIN_R	6	LIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MIC_L	10	MIC_R

IDE Connector

The board provides a set of parallel IDE connector (Pitch: 2.0mm), which shares an IDE bus with the CF card connector; therefore, please pay attention to the following issues when installing the IDE devices:

- If the CF card connector has been occupied with CF storage card, the IDE connector can only connect with one IDE device; one is Master device and the other is Slave device, which can be set via JP1. The relevant jumper is provided on the hard disk to set it to Master device or slave device;
- If the CF card connector is not occupied, the IDE connector can connect with two IDE devices. The way of connection is to connect the Master device to the end of the cable while connect the Slave device to the middle of the cable; when using an Ultra 66/100 hard disk, 80-pin appropriative flat cable shall be adopted.



IDE1

Pin	Signal Name	Pin	Signal Name
1	RESET#	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	Key
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IORDY	28	GND
29	DACK#	30	GND

31	IRQ	32	NC
33	DA1	34	ATA66_DET
35	DA0	36	DA2
37	CS1#	38	CS3#
39	LED#	40	GND
41	+5V	42	+5V
43	GND	44	GND

SATA Connector

The board provides two SATA sockets; the pin definitions are as follows:

SATA1/SATA2

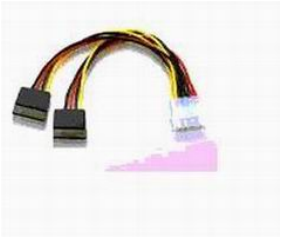
Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Hot-swap of SATA Hard Disk

Notices for hot-swap of SATA hard disk:

1. The hard disk shall support SATA 2.0 and use 15-pin SATA hard disk power connector.
2. The driver of chipset shall support the hot-swap of SATA hard disk.
3. Hot-swap of SATA hard disk with the operating system is forbidden when system is powered-on.

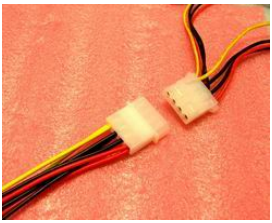
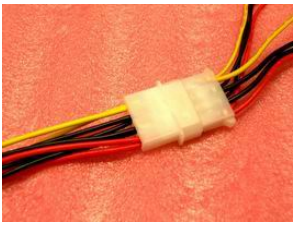
SATA Data Cable



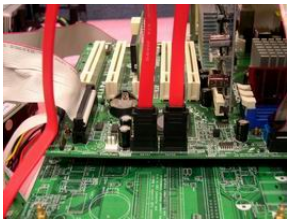
SATA Power Cable

Please carry out hot plug as follows, improper operation may destroy the hard disk or result in data lost.

Hot Plug

Step 1: Please plug the 1 x 4 pin SATA power connector (white) into the power adapter.



Step 2: Please connect the SATA data cable to the SATA connector on board.

Step 3: Please connect the 15-pin SATA power connector (black) to the SATA hard disk.

Step 4: Please connect the SATA data cable to the SATA hard disk.

Hot Unplug

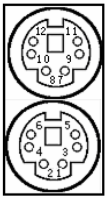
Step 1: Uninstall the hard disk from the device manager.

Step 2: Unplug the data cable from the SATA hard disk.

Step 3: Unplug the SATA 15-pin power connector (black) from the SATA hard disk.

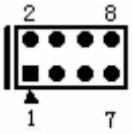
KM Connector

The board provides one standard PS/2 KM combined connector and one KM pin header (Pitch: 2.0mm).



KM1

Pin	Signal Name	Pin	Signal Name
1	KB_DATA	7	MS_DATA
2	NC	8	NC
3	GND	9	GND
4	+5V	10	+5V
5	KB_CLK	11	MS_CLK
6	NC	12	NC



KM2

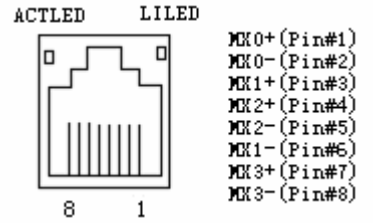
Pin	Signal Name	Pin	Signal Name
1	KB_DATA	2	MS_DATA
3	KB_CLK	4	MS_CLK
5	GND	6	GND
7	+5V	8	+5V

LAN Port and USB Port

The board provides two LAN ports and eight USB ports, among which one LAN port and two USB ports share a set of socket (i.e. J3 and J4 include one LAN port and two USB ports, respectively). In addition, the board also provides two 2x5 Pin USB connectors, (J5 and J6), which can connect with four USB devices.

LAN Port

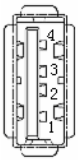
The board provides two 10/100/1000Mbps Ethernet connectors. ACTLED and LILED are the LED indicators beside the Ethernet port, which respectively indicates the activity status and the transmission status of LAN. Please refer to the status description for each LED:



J3(LAN1)/J4(LAN2)

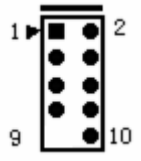
ACTLED (Green)	LAN Activity Status Indicator		LILED (Dual-Color: O/G)	LAN Speed Indicator
			Green	1000Mbps
Blink	Data Transmitting		Orange	100Mbps
Off	No Data to Transmit		Off	10Mbps

USB Port



J3(USB1/USB2)
J4(USB3/USB4)

Pin	Signal Name
1	+5V
2	USB_Data-
3	USB_Data+
4	GND

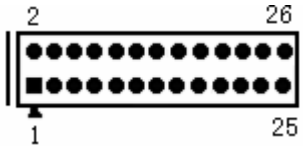


J5(USB5/USB6)
J6(USB7/USB8)
Pitch: 2.54mm

Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

Parallel Port

The board provides one 2x13Pin parallel port (Pitch: 2.0mm).

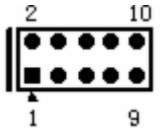


LPT1

Pin	Signal Name	Pin	Signal Name
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

GPIO Connector

The board provides one 2x5Pin GPIO pin header (Pitch: 2.0mm).



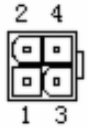
GPIO1

Pin	Signal Name	Pin	Signal Name
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

Note: the pins on GPIO are bi-directional signals. To facilitate test and application, the factory default value is that Pin 1, 3, 5, and 7 are for input while Pin 2, 4, 6 and 8 are for output.

Power Connector

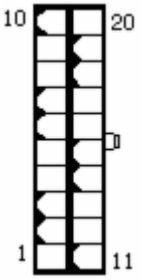
1) AT Power Connector: 12V Single Power Connector (Pitch: 4.2mm)



PWR2

Pin	Signal Name
1	GND
2	GND
3	+12V
4	+12V

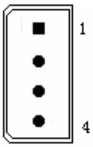
2) ATX Power Connector (Pitch: 4.2mm)



PWR1

Pin	Signal Name	Pin	Signal Name
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	-5V
9	+5VSB	19	+5V
10	+12V	20	+5V

3) SATA Power Connector (Pitch: 5.08mm)

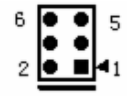


PWR3

Pin	Signal Name
1	+12V
2	GND
3	GND
4	+5V

Status Indicating and Control Connector

1) ATX Power Switch and HDD Indicator Connector (Pitch: 2.54mm)



FP1

Pin	Signal	Pin	Signal Name
1	PWRBTN#	2	GND
3	GND	4	RESET#
5	HDD_LED-	6	HDD_LED+

2) Power Indicator Connector (Pitch: 2.54mm)

FP2

Pin	Signal Name
1	PWR_LED+
2	NC
3	GND

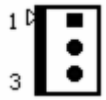
3) Loudspeaker Output Connector (Pitch: 2.54mm)

FP3

Pin	Signal Name
1	SPEAKER
2	NC
3	GND
4	+5V

Fan Connector

The board provides two 1x3Pin fan connectors (Pitch: 2.54mm).



CPUFAN1/SYSFAN1

Pin	Signal Name
1	GND
2	+12V
3	FAN_IO

FAN_IO: fan speed impulse output.

CF Card

Marked as CF1 onboard.

Pin	Signal Name	Pin	Signal Name
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

Expansion Slot

PCI slot is used as the standard PCI (version 2.3) connector (PCI1); the pin definitions are as follows:

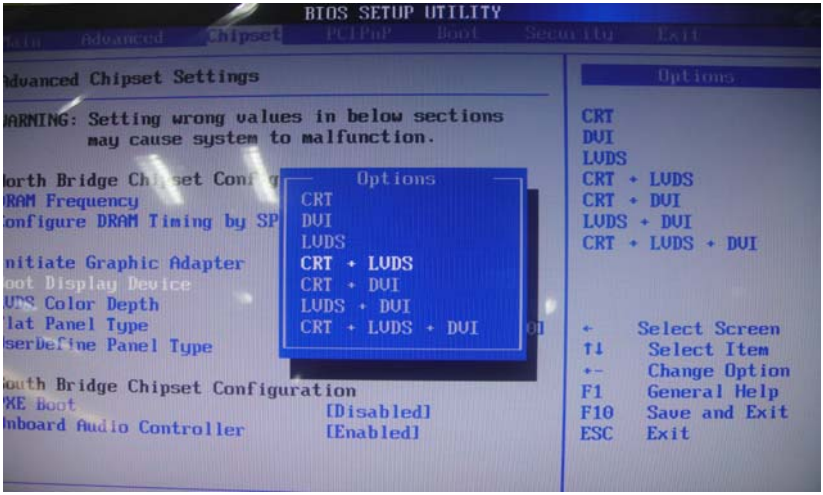
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	TRST#	A31	PCI_AD18	B1	-12V	B31	+3.3V
A2	+12V	A32	PCI_AD16	B2	TCK	B32	PCI_AD17
A3	TMS	A33	+3.3V	B3	GND	B33	PCI_C/BE#2
A4	TDI	A34	PCI_FRAME#	B4	TDO	B34	GND
A5	+5V	A35	GND	B5	+5V	B35	PCI_IRDY#
A6	INTA#	A36	PCI_TRDY#	B6	+5V	B36	+3.3V
A7	INTC#	A37	GND	B7	INTB#	B37	PCI_DEVSEL#
A8	+5V	A38	PCI_STOP#	B8	INTD#	B38	GND
A9	Null	A39	+3.3V	B9	PRSNT1#	B39	PCI_PLOCK#
A10	+5V	A40	SMCLK	B10	Null	B40	PCI_PERR#
A11	Null	A41	SMDATA	B11	PRSNT2#	B41	+3.3V
A12	GND	A42	GND	B12	GND	B42	PCI_SERR#
A13	GND	A43	PCI_PAR	B13	GND	B43	+3.3V
A14	3.3Vaux	A44	PCI_AD15	B14	Null	B44	PCI_C/BE#1
A15	PCI_RST#	A45	+3.3V	B15	GND	B45	PCI_AD14
A16	+5V	A46	PCI_AD13	B16	PCI_CLK	B46	GND
A17	PCI_GNT#	A47	PCI_AD11	B17	GND	B47	PCI_AD12
A18	GND	A48	GND	B18	PCI_REQ#	B48	PCI_AD10
A19	PCI_PME#	A49	PCI_AD9	B19	+5V	B49	GND
A20	PCI_AD30	A50	PCI_C/BE#0	B20	PCI_AD31	B50	PCI_AD8
A21	+3.3V	A51	+3.3V	B21	PCI_AD29	B51	PCI_AD7
A22	PCI_AD28	A52	PCI_AD6	B22	GND	B52	+3.3V
A23	PCI_AD26	A53	PCI_AD4	B23	PCI_AD27	B53	PCI_AD5
A24	GND	A54	GND	B24	PCI_AD25	B54	PCI_AD3
A25	PCI_AD24	A55	PCI_AD2	B25	+3.3V	B55	GND
A26	PCI_IDSEL	A56	PCI_AD0	B26	PCI_C/BE#3	B56	PCI_AD1
A27	+3.3V	A57	+5V	B27	PCI_AD23	B57	+5V
A28	PCI_AD22	A58	PCI_REQ64#	B28	GND	B58	PCI_ACK64#
A29	PCI_AD20	A59	+5V	B29	PCI_AD21	B59	+5V
A30	GND	A60	+5V	B30	PCI_AD19	B60	+5V

Note: when adopting PWR2 to supply power, Pin B1 is NC.

Instructions for DVI Display Output

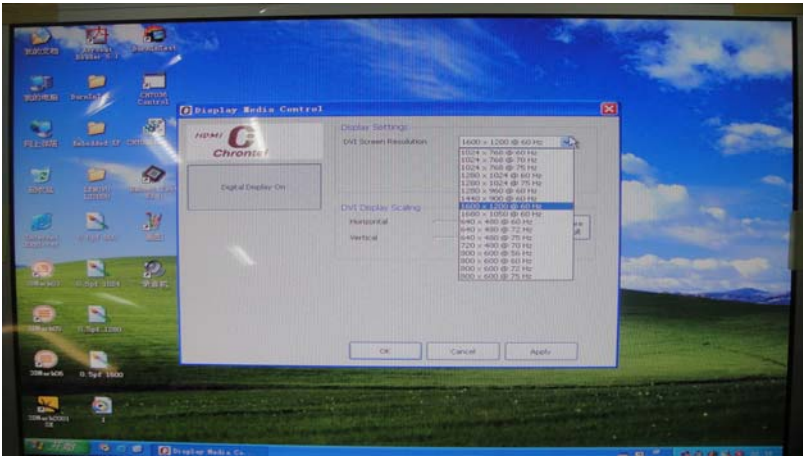
The board supports three display modes: VGA, LVDS and DVI; DVI display and LVDS display are Clone mode. Please set as follows:

1. Enter the BIOS menu to set the DVI display mode as shown in the figure below:

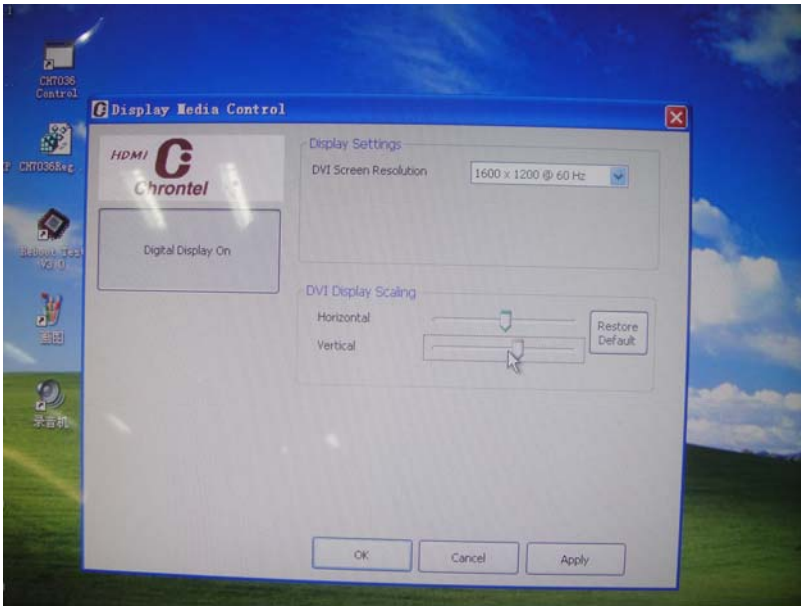


2. After installing the operating system for the first time, the DVI driver program is required; please install according to the enclosed CD. The driver can only be used to set the DVI display function. Users may choose 18-bit/24-bit LVDS output according to the connected LVDS screen. Please refer to Readme.txt for detailed driver program setting. The following interfaces will appear after completing driver installation:

3. Set the resolution for DVI. After the motherboard reads the resolution supported by the display, the resolution supported by the display will be shown. Please refer to the figure below:



4. Set the display dimensions of the DVI, DVI displays the extendable screen dimensions. Please refer to the figure below:



5. After setting the driver, the parameters are restored. It will display by the same configuration next time.

6. DVI display function is realized via CH7036A, which shall abide by the following suggestions: 1. The output resolution for DVI shall be no less than that of the LVDS set in the BIOS menu; if the output resolution for DVI is less than that of the LVDS, the fonts displayed under certain frequency might be blurred. 2. If the background color is set to pale blue, then erect stripes might appear under certain frequency; which is caused by the implementation mechanism of CH7036A and is normal.

Chapter 3 BIOS Setup

BIOS Overview

BIOS (Basic Input and Output System) is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and controlling interface for the upper level software system, guide operating system and so on. BIOS provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the BIOS correctly could enable the system operating stably and reliably; it could also improve the overall performance of the system at the same time. Inadequate even incorrect BIOS parameter setting will decrease the system operating capability and make the system unstable or even unable to operate normally.

BIOS Parameter Setup

Prompt message for BIOS setting may appear once the system is powered on. At that time (invalid at other time), press the key specified in the prompt message (usually <Del>) to enter BIOS setting.

When the BIOS setting in CMOS is destroyed, system may also require entering BIOS setting or selecting certain default value.

All the setup values modified by BIOS are saved in the CMOS storage in system. The CMOS storage is powered by battery; unless clearing CMOS is executed, its contents would not be lost even if powered off.

Note! BIOS setting will influence the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of BIOS to restore the system.

Our company is constantly researching and updating BIOS, its setup interface may be a bit different. The figure below is for reference only; it may be different from your BIOS setting in use.

Basic Function Setting for BIOS

After starting SETUP program, the main interface of CMOS Setup Utility will appear:

BIOS SETUP UTILITY	
System Overview	←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Processor Type : Intel(R) Atom(TM) CPU K510 @ 1.66GHz Speed :1666MHz Cores :2 System Memory Size :1015MB System Time [00:47:55] System Date [Mon 01/11/2010]	
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◆ **Main**

➢ **System Time**

Choose this option and set the current time by < + > / < - >, which is displayed in the format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59).

➢ **System Date**

Choose this option and set the current date by < + > / < - >, which is displayed in the format of month/date/year. Reasonable range for each option is: Month (Jan.-Dec.), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.).

◆ **Advanced**

BIOS SETUP UTILITY	
Advanced Settings	Configure CPU
WARNING: Setting wrong values in below sections may cause system to malfunction ►CPU Configuration ►IDE Configuration ►Super I/O Configuration ►Hardware Health Configuration ►USB Configuration ►Power Management Configuration ►Clock Generator Configuration	←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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➢ **CPU Configuration**

BIOS SETUP UTILITY		
Configure advanced CPU settings		
Brand String:		
Intel(R) Atom(TM) CPU K510	@ 1.66GHz	
Frequency;	:1.66GHz	←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
FSB Speed;	:667MHz	
Cache L1;	:48 KB	
Cache L2;	:1024 KB	
Ratio Actual Value	:10	
Hyper Threading Technology	[Enabled]	
Intel(R) SpeedStep(tm) tech	[Enabled]	
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- **Hyper Threading Technology**

  Control switch for the Intel Hyper Threading Technology function.

- **Intel(R) SpeedStep(tm) tech**

  Control switch for the Intel(R) SpeedStep(tm) tech function.

➢ **IDE Configuration**

BIOS SETUP UTILITY		
IDE Configuration		
ATA/IDE Configuration	[Enhanced]	
Configure SATA as	[IDE]	
		←→ Select Screen
		↑↓ Select Item
▶Primary IDE Master	:[Not Detected]	+- Change Field
▶Primary IDE Slave	:[Not Detected]	Tab Select Field
▶Secondary IDE Master	:[Not Detected]	F1 General Help
▶Secondary IDE Slave	:[Not Detected]	F10 Save and Exit
▶Third IDE Master	:[Not Detected]	ESC Exit
▶Third IDE Slave	:[Not Detected]	
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- **ATA/IDE Configuration**

  This option is used to configure the operating mode for ATA; there are two options: Enhanced and Compatible.

- **Configure SATA as**

  SATA controller type selection; there are two options for this item: IDE and AHCI. Only when the ATA/IDE Configuration is under Enhanced mode, is AHCI supported.

  The AHCI function requires supports from hardware chip and OS.

- **Legacy IDE Channels**

Configure the IDE channel type under Compatible mode; there are four options: SATA Only, SATA Pri, PATA Sec and PATA Only.

- **Primary ~ Third IDE Master/Slave**

  *** Type**

  Not Installed: no IDE device can be detected by system;

  AUTO: automatic detection of IDE parameters when powering on;

  CD/DVD: used for ATAPI CDROM;

  ARMD: used for various analog IDE devices.

  *** LBA/Large Mode**

  Used to set whether to support LBA mode or not.

  *** Block(Multi-sector Transfer)**

  Used to set whether to support multi-sector simultaneous transfer or not.

  *** PIO Mode**

  Used for PIO mode setting.

  *** DMA Mode**

  Used for DMA mode setting.

  *** S.M.A.R.T**

  Used to set whether to enable S.M.A.R.T function and it is only available for the hard disk supporting this function.

  *** 32Bit Data Transfer**

  This option is used to enable the 32-bit hard disk accessing mode, which could optimize hard disk read and write speed.

- **AHCI Port0 ~ 2**

  AHCI configuration menu, which is displayed only when the SATA controller is configured as AHCI or RAID.

  *** SATA Port0 ~ 2**

  Auto: automatic detection of SATA device when powering on;

  Not Installed: disable the port without inspection.

  *** S.M.A.R.T**

  Used to set whether to enable S.M.A.R.T function and it is only available for the hard disk supporting this function.

➢ **Super I/O Configuration**

BIOS SETUP UTILITY		
Configure Super I/O Chipset		Allows BIOS to Enable or Disable Floppy Controller.
OnBoard Floppy Controller	[Enabled]	
Serial Port1 Address	[3F8]	
Serial Port1 IRQ	[4]	
Serial Port2 Address	[2F8]	
Serial Port2 IRQ	[4]	
Serial Port3 Address	[3E8]	
Serial Port3 IRQ	[3]	
Serial Port4 Address	[2E8]	
Serial Port4 IRQ	[3]	
Serial Port5 Address	[2F0]	
Serial Port5 IRQ	[10]	
Serial Port6 Address	[2E0]	
Serial Port6 IRQ	[10]	
Serial Port7 Address	[200]	←→ Select Screen
Serial Port7 IRQ	[11]	↑↓ Select Item
Serial Port8 Address	[208]	+ - Change Field
Serial Port8 IRQ	[11]	Tab Select Field
Serial Port9 Address	[210]	F1 General Help
Serial Port9 IRQ	[11]	F10 Save and Exit
Serial Port10 Address	[218]	ESC Exit
Serial Port10 IRQ	[11]	
Parallel Port Address	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	
Uart IRQ Attribute	[Edge Active High]	
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- **OnBoard Floppy Controller**

  Used to enable the floppy driver controller.

- **Serial Port n Address**

  Set the addresses of the serial port n on motherboard (n=1…10).

- **Serial Port n IRQ**

  Set the IRQs of the serial port n on motherboard (n=1…10).

- **Parallel Port Address**

  Set the addresses of the parallel port on motherboard; the default value is 378.

- **Parallel Port Mode**

  Set the modes for the parallel port on motherboard.

- **Parallel Port IRQ**

  Set the IRQs of the parallel port on motherboard.

- **Uart IRQ Attribute**

  Set the IRQ attribute for COM 7-10.

➢ **Hardware Health Configuration**

BIOS SETUP UTILITY		
Hardware Health Configuration		Enables Hardware Health Monitoring Device
System Temperature	: 30℃/86℉	
CPU Temperature	: 37℃/98℉	
SYSFAN1		
CPUFAN1		
		←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Vcore	: 1.136 V	
V3.3	: 3.296 V	
V5.0	: 5.094 V	
V12.0	: 12.196 V	
VBAT	: 3.152 V	
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- **System Temperature**

  Current system temperature, it is monitored by thermal resistor on motherboard.

- **CPU Temperature**

  Current CPU temperature, it is monitored by temperature sensors on motherboard.

- **Vcore**

  CPU core voltage;

- **V3.3/ V5.0/ V12.0**

  Turn on/off power to output voltage.

- **VBAT**

  Monitor the battery voltage.

➢ **USB Configuration**

BIOS SETUP UTILITY		
USB Configuration		Enables USB host controllers.
USB Devices Enabled:		
1 Keyboard, 1 Drive		
USB Function	[8 USB Ports]	←→ Select Screen
USB 2.0 Controller	[Enabled]	↑↓ Select Item
Legacy USB Support	[Auto]	+ - Change Field
►USB Mass Storage Device Configuration		F1 General Help F10 Save and Exit ESC Exit
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- **USB Function**

  This option sets the amount of USB controller; that is to confirm how many USB controllers are supported. One controller usually supports two USB ports.

- **USB 2.0 Controller**

  This option is used to select whether to support USB 2.0 controller.

- **Legacy USB Support**

  This option is used to support legacy USB devices (such as keyboard, mouse and storage devices, etc); when this option is set to Enabled, the USB device could be used even if under OS that doesn't support USB, such as DOS.

- **USB Mass Storage Device Configuration**

  This option is used to configure the USB mass storage device, including Reset delay setting and enumeration type.

➢ **Power Management Configuration**

BIOS SETUP UTILITY		
Power Management Configuration		
ACPI APIC Support	[Enabled]	←→ Select Screen ↑↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
Restore on AC Power Loss	[Last state]	
Resume on RTC Alarm	[Disabled]	
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- **ACPI APIC Support**

  This option is used to enable or disable APIC under ACPI OS.

- **Restore on AC Power Loss**

  This option could set the system status when the computer is re-electrified after powered off under AC. “Power Off” is to make the system at power off status; “Power On” is to power on the system automatically; “Last State” is to recover the status before powering off.

- **Resume on RTC Alarm**

  This option is used to enable or disable the system clock. When the specified time expires, it will wake the system from power saving mode, even from power off mode. This function shall be supported by ATX power.

➢ **Clock Generator Configuration**

BIOS SETUP UTILITY		
Configure Clock Generator		
Spread Spectrum	[Enabled]	
Auto PCI Clock	[Enabled]	←→ Select Screen ↑↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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- **Spread Spectrum**

  This option is used to control the spread spectrum function of the clock signal.

- **Auto PCI Clock**

  This option is used to detect the devices on PCI slot automatically. If there are no devices in the slot, please disable the clock signal on that slot.

◆ **Chipset**

BIOS SETUP UTILITY		
Advanced Chipset Settings		
WARNING: Setting wrong values in sections below may cause system to malfunction.		
North Bridge Chipset Configuration		
DRAM Frequency	[Auto]	
Configure DRAM Timing by SPD	[Enabled]	←→ Select Screen
Initiate Graphic Adapter	[PCI/IGD]	↑↓ Select Item
Boot Display Device	[CRT+LVDS]	Enter Go to Sub Screen
LVDS Color Depth	[24BIT]	F1 General Help
Flat Panel Type	[800x600/S/18/G104S]	F10 Save and Exit
UserDefine Panel Type	[Disabled]	ESC Exit
South Bridge Chipset Configuration		
PXE Boot	[Disabled]	
Onboard Audio Controller	[Enabled]	
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➢ **DRAM Frequency**

Configure the frequency for DRAM; it is recommended to use automatic modification instead of manual modification; otherwise, it will not be able to power on because it is not supported by DRAM.

➢ **Configure DRAM Timing by SPD**

BIOS configures the time sequence of the SDRAM according to the contents of the SPD chip. Most of the memory bank has one small chip to save the time sequence and capacity of the memory, i.e. the SPD chip.

➢ **Initiate Graphic Adapter**

This option is used to specify the boot-up priority of the video device type.

➢ **Boot Display Device**

This option is used to select the default display device when booting.

- **LVDS Color Depth**

  This option is used to select the color depth of LVDS.

- **Flat Panel Type**

  This option is used to select the resolution for Flat Panel.

- **UserDefine Panel Type**

  Configure the flat panel display type according to user definition.

- **PXE Boot**

  This option is used to select whether to enable LAN PXE boot function.

- **Onboard Audio Controller**

  Select whether to enable the audio card controller.

◆ **PCIPnP**

BIOS SETUP UTILITY		
Advanced PCI/PnP Settings		
WARNING: Setting wrong values in below sections may cause system to malfunction.		
IRQ3	[Available]	←→ Select Screen
IRQ4	[Available]	↑↓ Select Item
IRQ5	[Available]	+ - Change Field
IRQ7	[Available]	F1 General Help
IRQ9	[Available]	F10 Save and Exit
IRQ10	[Available]	ESC Exit
IRQ11	[Available]	
IRQ14	[Available]	
IRQ15	[Available]	
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- **IRQ3 ~ 15**

  This option is used to specify whether the IRQ number is PNP mode or reserved for ISA.

◆ **Boot**

BIOS SETUP UTILITY		
Boot Settings		←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Quick Boot	[Enabled]	
Quiet Boot	[Disabled]	
Waite For 'F1' If Error	[Enabled]	
Boot Device Priority		
Boot from Embedded WinCE	[No]	
1st Boot Device	[USB: aigo USB DISK]	
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➢ **Quick Boot**

During BIOS booting period, configure whether to permit skipping certain test to reduce BIOS booting time.

➢ **Quiet Boot**

Configure whether to display the content of OEM LOGO.

➢ **Wait For 'F1' If Error**

Configure whether to prompt pressing "F1" during system error.

➢ **Boot from Embedded WinCE**

Configure to boot from WinCE system.

➢ **1st ~ 4th Boot Device**

Configure the priority of the boot sequence for devices when the system boots.

◆ **Security**

BIOS SETUP UTILITY	
Security Settings	Install or Change the password
Supervisor Password :Not Installed	
User Password :Not Installed	←→ Select Screen ↑↓ Select Item Enter Change F1 General Help F10 Save and Exit ESC Exit
Change Supervisor Password	
Change User Password	
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➢ **Change User/ Supervisor Password**

After pressing Change User/ Supervisor Password and input new password in the dialog box, this column will indicate that user's password has been installed.

◆ **Exit**

South Bridge Configuration	
Exit Options	Exit system setup after saving the changes.
Save Changes and Exit	
Discard Changes and Exit	←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Discard Changes	
Load Optimal Defaults	
Load Failsafe Defaults	
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- **Save Changes and Exit**

  When you have finished all the changes and want to cover the original parameters, you may implement this operation and save the new parameters into CMOS storage. To implement this operation, you may choose this option and press < Enter >; press < Enter > again to exit.

- **Discard Changes and Exit**

  If you do not want to save the change into CMOS storage, please choose this option and press < Enter >; press < Enter > again to exit.

- **Discard Changes**

  If error occurs in your change and the changes need to be neglected, please choose this option and press < Enter > in order to enter corresponding options again and reset it.

- **Load Optimal Defaults**

  This menu is used to input default value in system configuration. These default values are optimized and could give play to the high capability of all hardware.

- **Load Failsafe Defaults**

  The function of this option is to initialize the setup of each option to realize the most fundamental and secure system functional value. To implement this function, choose this option and press < Enter >; messages to be confirmed will be shown on the screen, press < Enter > to implement this function.

System Resource Managed by BIOS under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

◆ **DMA**

Level	Function
DMA0	DRAM Refresh
DMA1	Unassigned
DMA2	Unassigned
DMA3	Unassigned (sometimes used for hard disk)
DMA4	Used for DMAC Cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

◆ **APIC**

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function, and currently, only the OS above Windows 2000 could support that function.

◆ **IO Port Address**

There is 64K for the system I/O address space. Each peripheral will occupy portion of the space. The table below shows parts of the distribution of the I/O address. As the address of PCI device (e.g. PCI network card) is configured by software, it is not listed in this table.

Address	Device Description
000h - 00Fh	DMA Controller #1
020h - 021h	Programmable Interrupt Controller #1
040h - 043h	System Timer
060h - 064h	Standard 101/102 Keyboard Controller
070h - 071h	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0A1h	Programmable Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h – 0FFh	Numeric Data Processor
1F0h - 1F7h	Primary IDE Channel
200h – 207h	COM7
208h – 20Fh	COM8
210h – 217h	COM9
218h – 21Fh	COM10
274h – 279h, A79h	PnP Configuration Register
2E0h – 2E7h	COM6
2E8h – 2EFh	COM4
2F0h – 2F7h	COM5
2F8h - 2FFh	COM2
378h - 37Fh	LPT1
3B0h – 2BBh	Intel(R) Graphics Media Accelerator 3150
3C0h – 2DFh	Intel(R) Graphics Media Accelerator 3150
3E8h – 3EFh	COM3
3F6h - 3F6h	Primary IDE Channel
3F8h - 3FFh	COM1
400h– 41Fh	SMBus Controller

◆ **IRQ Assignment Table**

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be distributed. The ISA devices claim to engross the interrupt. Only the plug and play ISA devices can be distributed by the BIOS or the OS. And several PCI devices share one interrupt through the distribution of BIOS or OS. The diagram below shows parts of the interrupt distribution under X86 platform, but it does not show the interrupt source occupied by the PCI devices.

Level	Function
IRQ0	System Timer
IRQ1	Standard 101/102 Key or Microsoft Keyboard
IRQ2	Programmable Interrupt Controller
IRQ3	COM#3-#4
IRQ4	COM#1-#2
IRQ5	Reserved
IRQ6	Reserved for FDD controller
IRQ7	Parallel Port
IRQ8	System CMOS/Real Time Clock
IRQ9	ACPI
IRQ10	COM#5-#6
IRQ11	COM#7-#10
IRQ12	PS/2 Mouse
IRQ13	Numeric Data Processor
IRQ14	Primary IDE
IRQ15	Reserved

Chapter 4 Install the Drivers

Regarding the driver program of this product, please refer to the accompanying CD.

Appendix

Watchdog Programming Guide

The board provides a programmable watchdog timer (WDT) up to 255 levels and time by minute or second. WDT timeout event can be programmed to reset system or generate a maskeable interrupt.

The available IRQ numbers for this board are: 3, 4, 5, 7, 9, 10 and 11.

Please modify the corresponding IRQ number in PCIPnP of BIOS Setup interface into "Reserved" before using.

The following describes WDT program in C language. The steps to program WDT are as follows:

- Enter WDT programming mode
- Set WDT operating mode, enable WDT/disable WDT.

(1) **Enter WDT Programming Mode**

```
#define   INDEX_PORT   0x2E
#define   DATA_PORT          0x2F

outportb(INDEX_PORT,0x87);
outportb(INDEX_PORT,0x01);
outportb(INDEX_PORT,0x55);
outportb(INDEX_PORT,0x55);
outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x07);
```

(2) **Set WDT operating mode, reset mode or interrupt mode:**

a. **Configure** WDT **to reset mode**

```
outportb(INDEX_PORT,0x72)
outportb(DATA_PORT,00);
outportb(INDEX_PORT,0x72);
 int val=inportb(DATA_PORT);
```

```
    val |=0x40;
    outportb(DATA_PORT, val);
```

b. **Configure** WDT **to interrupt mode**

```
    outportb(INDEX_PORT,0x72)
    outportb(DATA_PORT,IRQ_ NO); /*Please replace the constant IRQ_NO with the interrupt number need to be used. The available range of the interrupt number has been listed in the beginning of this chapter*/
    outportb(INDEX_PORT,0X72);
    int val=inportb(DATA_PORT);
    val&=0xBF;
    outportb(DATA_PORT, val);
```

(3) **Configure** WDT **to time by minute or second:**

a. **Time by minute:**

```
    val &=0x7f;
    outportb(INDEX_PORT, 0x72);
    outportb(DATA_PORT,      val);
```

b.**Time by second:**

```
    val |=0x80;
    outportb(INDEX_PORT, 0x72);
    outportb(DATA_PORT,      val);
```

(4) **Enable/Disable** WDT

a. **Enable WDT:**

```
    outportb(INDEX_PORT,0x73);
    outportb(DATA_PORT,TIME_OUT_VALUE); /*Please replace the constant TIME_OUT_VALUE with the unit number of timeout value (0x01 ~ 0xFF)*/
```

b. **Disable WDT:**

```
    outportb(INDEX_PORT,0xf6);
    outportb(DATA_PORT,0x00);
```

Digital IO Programming Guide

The board provides 8-channel programmable digital IO pins, four for input while the other four for output.

The following provides digital I/O program in C language; please follow the steps below to implement digital I/O programming:

- Initialize digital I/O
- Input/output program

(1) **Initialize digital I/O:**

```
#define      BAR 0x400

unsigned char tmp_val;
outportb(BAR,0xbf);
outportb(BAR+0x04,0x40);
outportb(BAR+0x03,0x03);
outportb(BAR+0x05,0x0F);
tmp_val =(inportb(BAR+0x02)|0x08)&0xeb;
tmp_val |= 0x40;
outportb(BAR+0x02, tmp_val);
delay(30);
tmp_val =inportb(BAR);
while((tmp_val &0x02)!=0x02)
    {
        tmp_val =inportb(BAR);
        if((tmp_val &0x04)!=0)
        {
            printf("ERROR\n");
            return 0;
        }
    }
```

(2) **Input/output program:**

a. Output Program

Functions input: int pin - Value 1 ~ 4 are corresponding with output pin 1 ~ 4

int lev_val - 1 is to output high level; 0 is to output low level

Functions Output: none

```
void Out_Lev(int pin ,int lev_val)
   {
      unsigned int reg_val ;
      outportb(BAR,0xbf);
      outportb(BAR+0x04,0x40);
      outportb(BAR+0x03,0x01);
      reg_val = inportb(BAR+0x05);
      reg_val = lev_val ?
reg_val|(0x01<<pin+3) :reg_val&(~(0x01<<pin+3)) ;
      outportb(BAR+0x05, reg_val);
      reg_val =(inportb(BAR+0x02)|0x08)&0xeb;
      reg_val |= 0x40;
      outportb(BAR+0x02, reg_val);
      delay(30);
      reg_val =inportb(BAR);
      while((reg_val &0x02)!=0x02)
            {
                  reg_val =inportb(BAR);
                  if((reg_val &0x04)!=0)
                  {
                        printf("ERROR\n");
                        return 0;
                  }
            }
}
```

b. Input Program

Functions Input: int pin - Value 1 ~ 4 are corresponding with the input pin 1 ~ 4

Functions Output: int lev_val - 1: the input pin is high level; 0: the input pin is low level

```
int In_Lev(int pin)
{
    unsigned int reg_val ;
    int lev_val ;
    outportb(BAR,0xbf);
    outportb(BAR+0x04,0x41);
    outportb(BAR+0x03,0x00);
    reg_val =(inportb(BAR+0x02)|0x08)&0xeb;
    reg_val |= 0x40;
    outportb(BAR+0x02, reg_val);
    delay(30);
    reg_val =inportb(BAR);
    while((reg_val &0x02)!=0x02)
        {
            reg_val =inportb(BAR);
            if((reg_val &0x04)!=0)
            {
                printf("ERROR\n");
                return 0;
            }
        }
lev_val = inportb(BAR+0x05)&( 0x01<<pin-1);
lev_val = lev_val ? 1:0; /*Get the variable lev_val, 1 represents that the input pin is high level, while 0 represents the input pin is low level*/
    return lev_val ;
}
```

Troubleshooting and Solutions

NO.	Phenomenon	Troubleshooting and Solution
1	BIOS setting cannot be saved	Analysis: it could be the problem of the CMOS battery.
		Solution: measure the CMOS battery with a multi-meter; if the voltage is insufficient, replace the battery; re-set the BIOS and save again.
2	The computer can only be powered-on occasionally	Analysis: it may be caused by poor connection. Remove the power plug from power socket on motherboard, you may detect that certain pin of the motherboard power has been collapsed to one side after several times insertion.
		Solution: power off the computer and remove the power plug; erect the bended power pin with tweezers and re-insert in the power socket. Reboot the computer and test for several times until the problem no longer exits.
3	When connecting with a USB flash drive, the system prompts that a high-speed device has been connected with a low-speed connector.	Analysis: A USB flash drive is a high-speed USB2.0; when connecting with the computer, it prompts that a high-speed device has been connected with a low-speed connector, which indicates that the connector on motherboard is regarded as a USB1.1 port.
		Solution: enable the USB high-speed transmission mode on the motherboard. Different motherboards may have different settings. Change the FULLSPEED option to HISPEED in USB device option.
4	The screen has no display after replacing with a new memory and cannot enter system; even when the former memory is re-installed, the system cannot be booted as well.	Analysis: it could be resulted from improper operation when inserting or removing the memory and causes abnormal operation of the components on the motherboard. Focus on the circuit related to the memory on the motherboard.
		Solution: check the hardware such as memory, video card first; if it shows that the hardware are all OK, then check the circuit around the memory slot on motherboard carefully; you may detect that the two pins connected with the gold finger in the first memory slot are shorted while the second memory slot is normal, then you may know that there is short circuit in the first memory slot. Remove the two pins to their original location with tweezers carefully, insert the memory, reboot the system and the system will be booted smoothly.

5	The system cannot be booted after replacing a CD-ROM.	Analysis: the data cable of the hard disk may get knocked when installing the CD-ROM, which leads to poor connection of the hard disk data cable, or the master and slave jumpers on hard disk and CD-ROM are wrongly set.
		Solution: check the data cable of the hard disk and the IDE connectors on hard disk and motherboard first; if there are no problems, then check the master and slave jumper setting. You may detect that the hard disk and CD-ROM are connected with different data cables while their jumpers are all set to master; thus, the hard disk cannot be booted. Set the CD-ROM jumper to slave and then re-install it.
6	No PCI card can be detected after entering the system.	Analysis: make sure the PCI card functions normally; re-insert the PCI card or insert it into another PCI slot to see whether it is normal; find out the power type in use (AT or ATX); find out users' requirement for the PCI card voltage.
		Solution: if the PCI card functions abnormally, replace it with a new one; if it functions normally when re-inserted or inserted in another PCI slot, then there is something wrong between the PCI card and the slot. If AT power is adopted and the PCI card requires 3.3V voltage, then the AT power shall be replaced with ATX power because AT power cannot provide 3.3V voltage. (Suggestion: when purchasing power supplies, please check whether the PCI card in use requires 3.3V voltage or not).
7	No peripheral devices can be detected.	Analysis: devices are not connected; no drivers are loaded; devices are broken.
		Solution: check whether the cable between the device and the motherboard is normal; if it is normal, replace it with a new cable to make sure the connection is OK. Re-install the device driver and check whether it can be recognized; check whether the device is normal; if the device is normal, then check whether the device is compatible with the motherboard.